The Builder.

Vol. XLII. No. 2159. Saturday, February 28, 1882.

ILLUSTRATIONS.

St. Clement's Church, City-road.—Mr. Butterfield, Architect 223
Capital and Counties Bank: New Premises, Aldershott Branch.—Mr. Fred. Mew, Architect 224
The Water Gate: a Composition in Pen and Ink by H. W. Brewer (Double-page Engraving).—From the Black and White Exhibition, Dudley Gallery 225
Sketches of Proposed Covered Way for Sir Henry Cole 230
Bishop Zobel's Pillar, Wurzburg 231

CONTENTS.

Greek and Roman Sculpture 221
The Municipal Government of Paris 229
The Fireproof Curtain in Theatres 234
The Decay of Monumental Sculpture 234
Art Clubs Abroad 235
The Canal Interest and the Board of Trade 235
Uniformity in Building and Sanitary Legislation: Royal Institute of British Architects 236
The New Imperial Parliament House of Germany 239
The Decoration of the Pantheon, Paris 239
Passenger Traffic on Railways 240
News from Berlin 240
Roman Remains, near Leigh 240
St. Lorenzo in Damaso, Rome 240
The Glossograph 240
St. Clement's Church, City-road 240
The Water Gate 240
The Capital and Counties Bank, Aldershott Branch 239
Glass Shelters in Streets 239
Bishop Zobel's Pillar, Wurzburg 231
Physical Science in Relation to Architecture: Architectural Association 241
An Archæological Traveller of the Seventeenth Century 244
Notes from the West 244
The Sanitary Assurance Association 245
The Fall of a Staging in Oxford-street 245
Competitions 245
Wind Pressure 246
Royal Naval Engineers 246
Cork School of Music 246
The Late Mr. Francis Beattie 246
Industrial and Sanitary Exhibition at Sunderland 246
Building Patents 246
Marble Decoration 246
Custom House and West Quay 246
Competition for Sculpture: St. George's Hall, Liverpool 247
Public Record Office 247
Roof Coverings for Cattle Sheds 247
Specifications 247
Munich Glass 247
Plumbers' Ways and the Cost of Plumbing 247
Drapers v. Builders and Decorators 248
Wood Paving 248
School-Building News 248
Church-Building News 248
Books: Morris's Hopes and Fears for Art (Ellis & White); Taylor's Towers and Steeples designed by Sir Christopher Wren (Batsford); Records of St. Michael's Parish Church, Bishop's Stortford (Stock) 249
The Patrick Steel Hospital, Haleereuth 250
Miscellanea 250

Greek and Roman Sculpture

THE production of a tolerably large and profusely illustrated volume, designed as a popular aid to the study of Classic sculpture,* may, we hope, be taken as a sign of an increased interest in this form of art, as well as a means of increasing and directing that interest. Certainly it is not many years since the production of a popular treatise on the subject, on this scale, would have been considered a hopeless venture by authors and publishers equally, and even now a work on such a subject is not likely to attract half the interest which an equally competent work on the history of painting would evoke.

The consideration of the causes of this limited interest in sculpture in modern times forms a kind of complementary problem to that opposite one, as to the causes of the great interest in sculpture among the Greeks, and their unequalled success in the art. The influences which were notably present in favour of the development of sculpture among the Greeks, we should expect to find notably absent in our own day, when, as Mr. Perry says, even the sculptors themselves admit the comparative failure of their art. Part of the book before us being directed to the consideration of the influences which operated in favour of antique sculpture, readers may thence be able to deduce an idea of the causes which operate against it in modern times, and thus draw a double lesson.

The object of the author, as set forth in his preface, is not only to furnish the amateur with the knowledge necessary to enable him to understand and appreciate the remains of ancient sculpture in museums, but also to set before the artist the principles by which the greatest masters in the greatest period of the art were guided, "and to direct the attention of the student of ancient history to one of the most interesting and characteristic sides of Greek life, and to show him the intimate relation between Greek art and the religious, political, and social life of the Greek people."

This is a tolerably ambitious programme, it must be admitted, for one writer to propound in one volume, even though a bulky one. As to the questions involved in the principles of sculpture, we cannot find that these are anywhere systematically or fully treated of, the few reflections which bear on this part of the subject being for the most part introduced rather at haphazard and in an unconnected way. The Introduction gives us, in a connected form, the author's own idea as to the *rationale* of sculpture, which, as far as it goes, we regard as perfectly sound and true. He brings into prominence the fact that sculpture, of all the imitative arts, is, or should be, the least realistically imitative. It "must rest on a careful and comprehensive study of the structure and forms of living men. Yet here, again, we must repeat that a statue is only a work of art, in the higher sense, when it is the embodiment and representation of an art idea. The sculptor studies the forms and motions of a thousand living men, but he copies no one of them. He is able to conceive and to create a form which is far above his actual experience, and which he uses as the fitting expression of his sublimest thoughts. The natural world produces nothing in absolute perfection,—not a leaf, not a flower, not one of the infinite variety of living animals, not a man, not even a woman." This latter proposition is too strongly put. Nature certainly produces perfect forms occasionally in animals, and in men and women. As a rule, no doubt, a sculptor has to modify his model, by drawing on his own acquired knowledge derived from the general average of types, in order to realise the beauty which he seldom sees before him in visible form. But there are other reasons for modification besides this. Too minute realism in sculpture would tend to failure, simply from suggesting an aim which cannot be attained where modelling only can be imitated, without texture or colour. The painter may aim at realism, for he has all, or nearly all, the materials and conditions for it; the sculptor has not, and absolute realism in modelling only draws attention to the impossibility of realism in other particulars. The balance in the relation of the copy to nature is thus destroyed. And considering that the highest mission of sculpture lies in giving form to ideal conceptions, too minute realism is also injurious to the ideal effect aimed at, as drawing the eye too much to minutiæ at the expense of the unity of the conception as a whole. Any one who has seen a figure modelled from the life in clay with the greatest possible realism must have felt how some of the minutiæ of modelling, the small folds and creases of the natural body, interfered with the statuesque effect of the figure as a whole, and why such minutiæ require to be smoothed and refined away before the highest sculptural expression can be realised. In another part of the book the author quotes Cicero as giving evidence of a recognition of the same principle; though only introduced as an illustration in one of his orations, the passage is not the less significant of the manner in which the art was then regarded by a highly cultivated and gifted man who was not an artist. Cicero's words are, "The great artist, when he was moulding his Jupiter or Minerva, was not looking at any form of these deities of which he might make a copy, but there dwelt in his mind a certain form (*species*) of surpassing beauty, the sight and intense contemplation of which directed his art and his hand to produce a similitude." It is when considered in this light that sculpture is, or ought to be, a kind of antidote to the too prevalent realism of other forms of art at the present moment; a realism which has unfortunately too much invaded modern sculpture also, and brought it in some instances to most prosaic and even absurd manifestations.

In early sculpture the avoidance of realism of detail, invariably to be observed, would be the result of no principle, but simply of inability to model with the freedom and minute elaboration only attained in times when greater facility of execution had been, as we might say, inherited from one generation to another. The selection of what is suitable for sculptural treatment, and the rejection of what is not, then comes into operation as a portion of the æsthetic of sculpture; of the exercise of this careful intellectual selection we see evidence among all the works of the great Greek period. The distinction between this intentional and critical discernment as to the limits of the art, and the merely unconscious conventionalism of earlier and less complete periods, may be traced in all forms of art dealing with the representation of the human figure; but it is often quite overlooked, and we are called upon to admire the superior judgment of the artists of the imperfect period, for results which are really only due to their inferior powers of execution. Deficiency of technical skill keeps the earlier practisers of an art well within the bounds which are proper to the expression of that art; over-refinement in technical skill tempts the latest school in the same art into going beyond those limits in order to show their technical skill, at the expense of the highest and most characteristic expression. This is nowhere more evident than in sculpture, partly because in this art the conditions of success are more limited, and their transgression becomes more notable. Nothing, however, that can justly be called a degradation of sculpture occurs in late Greek or late Roman art, so far as we know it. The achievement of this "bad eminence" was reserved for late Renaissance and modern Italian sculpture. Considering the time covered by Greek and Roman sculpture, as illustrated in the book we are now speaking of, it is remarkable how slight is the decadence in the æsthetic ideal of sculpture, though the declension in dignity and completeness of style is marked enough. If we compare with this very gradual decadence of Classic sculpture, the rapid down-hill path of Renaissance sculpture; if we consider the immense gulf which separates Bernini from Donatello,

* "Greek and Roman Sculpture: a popular Introduction to the History of Greek and Roman Sculpture." By Walter Copland Perry. With 400 illustrations on wood. London: Longmans, Green, & Co. 1881.

artistically, and the comparatively brief time in which this defection was brought about, we must conclude that there was in Roman art a greater soul of goodness than is sometimes admitted, for their sculptors to have kept, for so long a period, so creditably near to their great Greek models.

The account given by Mr. Perry of the earlier stages of Greek sculpture, as far as they are known, is very clear and readable, and very fully illustrated. In speaking of the lions of Mycenæ, however, Mr. Perry conveys to some extent a wrong impression in describing the column between the animals as very un-Greek in character, and hardly assignable to any known style. Professor Lewis showed, not long since, in a communication in our columns, the almost precise identity of the mouldings at the top of the sculptured columns with the usual Attic base, only that the feature is inverted, the whole column appearing, indeed, as a column with its base uppermost and the necking at its foot, but no capital. The inversion of the column is a very curious and inexplicable fact; but the resemblance of the mouldings to the Attic base is far too close to be accidental.

A large space is devoted, naturally, to the Parthenon sculptures, the majority of which are reproduced in small but careful outline. In regard to the Panathenaic frieze, Mr. Perry draws attention to a peculiar detail often overlooked,—the carefully-contrived "iso-cephalism," or ranging of the heads of all the figures at about equal height, which is kept up throughout it, and is to some extent a characteristic of frieze sculpture. Mr. Perry attributes this arrangement to certain considerations in regard to the conditions of bas-relief, arising from the absence of real background in the case of true bas-relief figures (*i.e.*, figures in which the relief of the modelling is apparent rather than real), which necessitates the covering of the whole space with the figures. This seems to us a very roundabout and unsatisfactory explanation, as, after all, there is an appreciable extent of the ground unoccupied in the upper portion of the Parthenon frieze. The reason for keeping the heads level we take to be the desire to bring the frieze into proper decorative relation with the lines of the architecture, by preserving a horizontal level in the disposition of the figures. The ingenuity with which this is done causes the anomaly to pass off without notice in the case of many spectators, who do not perceive, till their attention is called to it, that the men on horseback rise no higher in the line of heads, or scarcely higher, than those on foot. The employment of a small scale for the horses, and to some extent a manipulation of scale and proportion in the riding figures, are the means taken to procure the desired result, which is certainly a gain in the decorative or architectural effect of the whole frieze. Let any one even mentally contrast the effect if the heads were at different levels, and the superior result of the actual arrangement, in relation to the building, will be obvious, though it is obtained at the expense of a curious falsification of scale in the sculpture.

Mr. Perry draws attention to differences of merit in the execution of various figures in this frieze, which, of course, cannot have been executed by the hand of one sculptor. He finds a difference in the horses on the south and north sides; the former, which were less seen by visitors, being executed with less care than those on the north side. Such is the author's conclusion, which we rather question, and which is at variance with other facts in connexion with the Parthenon sculpture. The fact, for instance, that all the figures of the tympana are finished as highly and completely in the back portions, which no one could ever see after the figures were *in situ*, seems quite at variance with the idea that the side of the frieze which would be perfectly visible, though likely to be less looked at than the other, should have been wilfully allowed to be carelessly executed. If the difference is there, we must trace it to accidental causes. The lesson to be learned from this frieze, in reference to modern sculpture, is plain enough, though very discouraging. Mr. Perry sums it up very well. The work sets before us, as he says, "the very form and spirit of Periclean Athens." From the gods of Olympus to the dumb animals that were sacrificed; "from the Archon and Eupatrid to the charioteer and slave-groom, all are there." There were the noble youths of "horse-loving" Athens, and the train of high-born Athenian maidens, with modest mien and gentle dignity and grace. "All that was sacred, powerful, and grand, all that was beautiful, graceful, and joyous in Athenian life, is represented there." The author calls the representation "idealised," but conventionalised would be the true expression. The forms are to some extent modified,—the animals especially,—for treatment in architectural sculpture, but in the main, the whole representation is realistic in intention, as far as the conditions of bas-relief sculpture allow. And it is when thus regarded that it speaks to us of some of the reasons of the great success of sculpture in ancient Athens, and of its non-success in modern life. The Athenian everyday life was beautiful and graceful in its usual manifestations: ours is not. Many critics and artists have recognised plainly enough the naïve and realistic character of the Parthenon frieze, and have proposed that subjects and incidents of the present day should be sculpturally treated on our buildings with the same realism and *naïveté*, as if the same method which produced the beautiful Greek sculpture would produce beautiful English sculpture. And yet no one, we imagine, has ever followed up in his mind the result which such a sculptural treatment of modern life would present, without being made to recoil by a feeling of the ridiculous side of such a representation. The difference is that natural everyday Greek life was graceful and beautiful, and had, in its simplicity, the true elements for sculptural subjects; that everyday English life is mostly not graceful and beautiful, and that, where it is, the grace and beauty are so artificial and (both in a material and metaphysical sense) so heavily draped, as to be quite unavailable for the purposes of sculpture. Painting may do a good deal with modern life; sculpture is nearly powerless in its presence, not to say contemptuous.

In speaking of the recently-discovered Olympian statues, Mr. Perry strongly decries the exaggerated statements made as to their surpassing excellence, "that they were fully equal to the Elgin marbles," &c. The enthusiasm of discoverers over their discoveries is natural, and, to a certain extent, contagious, but it must not be allowed to override true and judicious criticism. The gap between the Olympian and the Parthenon sculptures, except in regard to one or two figures of special excellence among the Olympian set, is very marked. The Olympian sculptures have somewhat of the character, as compared with the Athenian, of archaic art; a large and grand manner they show, no doubt, but great inferiority in regard to refinement of execution and life-like character and expression. In regard to the Parthenon sculptures, the author refers again to the old vexed question of Lord Elgin and the *morale* of his raid on the Parthenon: he sums up, as we think every person in whom sentiment does not override practical common sense must do, in favour of Lord Elgin, whose action, by whatever motives prompted, unquestionably was the means of preserving and giving to all the civilised world the greatest works in the world's sculpture, which would otherwise before now have perished, or nearly so, under the hands of brutal and ignorant spoilers.

In treating the later developments of Greek sculpture, the author brings out, whether intentionally or not, points offering a remarkable parallel with some of the tendencies of modern art at the present moment. The school of which Praxiteles was the centre he describes as one devoted to "the Aphrodisian cult," the school which drew its models from the superior class of *Hetairai* (women of loose character), who filled so large a place in later Greek society. The *Hetairai* did not gain a large or general influence in Greek society till after the Peloponnesian war. "Such a scene as that recorded by Athenæus, who relates that Phryne, letting down her hair, descended into the sea before all the Greeks at the public festival at Eleusis, would have been impossible at any earlier period, and clearly shows to what an extent the worship of mere beauty had lowered the tone of the national morality." Praxiteles became accordingly the highest representative of a school of sculptors who aimed at the realisation of a graceful seductive beauty in their works, with much less grandeur of style than in the Pheidian age, and with no elevation of feeling whatever. Without necessarily drawing the social parallel, we certainly seem to see something of an artistic parallel in the works of a sect of artists who at present seem to have set up a kind of Aphrodisian cult, a *penchant* for languid, unintellectual, sensuous forms, deficient both in artistic and moral force of expression. It is significant to remember that this tendency in art was, as we can now see, the accompaniment or sign of the decadence of Greek art and society. In the present day it is put forward by its votaries as part of the revival of art (about society they care little); with how much truth time will show.

The period to which most of the Roman works of sculpture with which we are acquainted belonged is called by the author a "period of imitation," and that is probably about the truth of it. We have to be grateful, however, to this art of imitation for having preserved to us what appear to be good copies of some great Greek works, the originals of which we should otherwise know of only by description. The Roman influence upon Greek sculptors of the Roman period Mr. Perry thinks was ("strange to say," as he adds) both healing and elevating, in the century before and the century after Christ. "The Romans had not yet lost their faith in the gods, nor the sense of personal dignity which accompanied that faith. They wished to see both the deities whom they worshipped, and the chiefs whom they obeyed, represented in the severe and dignified forms of antiquity. The *dii majores*,—the Jupiters, Junos, and Minervas,—become once more the subject of plastic art, and the artist prepared himself for his arduous task by the study of Pheidias and Polycleitus. He went far up the stream of Grecian art and drew from its yet unpolluted waters. And hence the phenomenon that some of the finest works which have come down to us are just from this late period, and that we see in Rome a sort of after-glow of the hey-day of Attic sculpture." "Hey-day" seems a peculiarly unfortunate and undignified expression to use in connexion with such a subject, but the view stated is, we imagine true, and it affords an interesting example of the influence of religious and social conditions upon the arts. Of the Venus de Medici even, while recognising it as in the main a purely sensuous work (and probably a Roman reproduction of the idea of the Cnidian Venus of Praxiteles), the author can afford to speak very kindly, observing that "even at the lowest estimate which the coolest critic can form of the Medician Venus, how favourably does she, in her refined and 'innocent voluptuousness,' contrast with the goddesses and nymphs of many an illustrious painter of the Middle Ages, and with the meretricious minxes of some modern schools of sculpture." And this is true enough. And yet there can be little doubt that the Medici Venus was produced in a society to which the worst social abuses of this day are comparative purity. Perhaps Mr. Perry's foot-note supplies one explanation,—"The modern Venus, in too many cases, is not moulded and painted by nature, but by bastard art with the aid of corsets and cosmetics." That is part of the secret. There was at least a more natural and healthy costume in those days, and the human form was not pinched and pulled out of shape.

We must refer the reader to the book for further considerations of the subject. Mr. Perry has filled a gap in what may be called the higher-class popular literature of art, and filled it exceedingly well.

THE MUNICIPAL GOVERNMENT OF PARIS.

No one can visit Paris, be he ever so unobservant, without being struck, after a very few days' stay, with the magnitude of the cost at which the order he sees about him must have been obtained. It is true, the stranger is kept more within certain limits specially prepared for his reception than he is in London, the enormous size of which would, we suspect, almost baffle even French powers of organisation; but while, unquestionably, considerably larger sums are expended on the "strangers' quarter" in Paris than is the case in more distant neighbourhoods, the system by which the whole is regulated is the same for all, and the general expense of the whole is shared by all, just as the enjoyment of the more decorative parts of the capital is open to all, though it may be remarked that there is not such an absence as is at first apparent,—always excluding certain terrible neighbourhoods,—of beauty and charm in the less stranger-frequented portions of Paris. There are to be found the same tall stone houses, the same pretty squares open to the public with their Sunday bands of military music, the same green gardens, round the statues

and fountains of which the children play; there are the same tree-planted streets and boulevards, with their welcome well-shaded seats; the same kiosks, the same well-supplied markets that are to be found in the better neighbourhoods. And again, always excepting certain miserable parts of the capital,—every "apartment" in Paris has its *cabinet noir*,—there are not to be found, as with us, those differences so marked between one neighbourhood and another; a blessing which may, to some extent, be attributed to the central form of government which Paris enjoys, distributing with more or less equality over each portion of the capital the advantages specially enjoyed by those fortunate enough to occupy the more expensive neighbourhoods. Of the central form of municipal government we may premise one more remark, omitted in referring not long since to the government of New York, that the peculation and jobbery with which stand accused the officials of the Empire city, are solely due to the indifference of the ratepayers in the election of their town councillors. It is well known that it is alone owing to this acknowledged fact that the central government of New York State, held at Albany, refuse to leave the municipality of New York (city) its entire liberty. A representative form of government, when honestly exercised, affords the surest means of effecting whatever may be the expressed desires and needs of the majority. It is by the exercise of these their rights, let us repeat, that the Parisian ratepayers have effected the results which, when the stranger visits Paris, he is forced to admire.

Having in a former article* explained to some extent the nature of the municipal government of Paris, we may now, in accordance with our promise, proceed to deal more specially with the action of the various commissions with which lie, as with our own London Corporation and those of every city in the world, the expenditure of the annual budget. First among the expenses of this budget comes the item for the police. Of the police of Paris, so important a factor in the government of the city, it is difficult in the limits of a few lines to speak fully,† it may, however, be said that, generally speaking, the Paris police, except that its organisation is more masterly, resembles greatly that of London or of any other great city. It is an old complaint that the species of suspicion, chiefly political, with which everybody is regarded,—this feeling, fortunately is daily diminishing,—leads to an amount of inquiry and prying that to the Anglo-Saxon is singular offensive, and which is happily scarcely known in England and America. It may be stated that there are some 8,000 policemen and seventy *commissaires* distributed through the eighty *quartiers* of Paris, with, of course, a large body of police officials. The Prefecture of Police costs yearly some 800,000*l.*, half of which is paid by the Government. The Prefecture of Police consists, it may be stated, of three *bureaux*, subdivided, of course, into numerous other *bureaux*. The first deals solely with political affairs, secret societies, public meetings, Masonic lodges, refugees, and lastly, the strangers, the presence of each of whom on his first arrival in Paris is, as is well known, reported immediately to the police, who docket his name for future reference. The second bureau deals more particularly with the public amusements, fêtes, reviews, races, theatres, &c. though it may be mentioned that the theatres in Paris are not put in charge of the police, but of the *Garde Républicaine*, another important branch of the Paris police, though in reality part of the army, remaining, however, always in the capital. The third bureau deals solely with the foreign and French journals, the translation of documents, telegraphic messages, &c. The systematic arrangement of the whole French police is a marvel of organisation, to describe which alone would require considerably more space than is at our disposal, or than the subject in its relation to the municipal government of Paris requires. As for the Fire Brigade of Paris, admirable as is its management, its small number of men, barely 2,000, distributed over eighty fire-stations, is very far, Parisians freely admit, from being what it should be. Paris, it is true, is freer from fires than London and other cities, owing to the strength and solidity of its stone buildings, the tenure allowing of building almost for eternity in Paris; but several fires that have recently occurred have shown sadly the deficiency of the Paris Fire Brigade, though Paris pays for its protection over 70,000*l.* Captain Shaw has constantly complained that the 30,000*l.* which our London Fire Brigade costs us is miserably insufficient.

Paris, until within a few years, was very insufficiently supplied with water,* but within a generation the efforts made in this direction have remedied an inconvenience, which still, however, requires further consideration, the pending settlement of which almost renders any statement at present useless. The municipality are discussing this all-important question, the separate supply of water to the capital for each of the great services, the household use, and the public use in the streets, fountains, drains, &c. Suffice it to state to those whom it may interest that it is calculated that something like over three million *litres*, about 700,000 gallons, of water *per diem* are supplied, a third of which is used for household purposes, the remaining two-thirds for the public service, watering the streets,—down each side of which is kept flowing during some hours in the day a constant supply of water,—flushing the drains, &c. This, we hope, may dispense with any detailed account of the capacities for water-supply of the aqueduct of the Ourcq, or that of Arcueil,—a monumental work which no visitor to Paris should fail to see,—the Dhuis, the Vanne, the Seine, and the artesian wells of Grenelle and Passy, and their several reservoirs. It may be stated that, as in London, there are not wanting complaints on the part of the householders as regards the high water-rates,—consequent on some unfortunate arrangement made many years since between the city and the water company,—complaints which are only too well founded while the supply of water is so deficient, and while some 50,000 houses in Paris are still utterly unsupplied with this first necessity of public hygiene.

An ample water supply is an absolute need in a great city, and the task of getting rid of this supply, daily rendered foul by use, is another, and apparently even more difficulty duty, one with which Paris has to some extent grappled, though it can scarcely be said to have solved. It can be understood that the management of something like 300,000 to 400,000 cubic yards of water is no small matter. Within a few years immense improvements have been effected. The Seine is no longer, within the walls at least, the receptacle of all the filth of the city: a network of drains has been laid that carries to a distance the liquid flood which, so chemically injurious to human life, contains such invaluable aids to vegetable culture; but, in spite of all the efforts so far made to realise to the full these advantages, the attempt may still be said to be only in an experimental stage. The Seine, disinfected in the portion that flows through Paris, receives most of the city sewage at Asnières, poisoning all the river for miles below.† Of the efforts made to utilise for agricultural purposes the sewage of the city, it may be said that they have, to a great extent, been crowned with success. The city of Paris took in hand the question, and at its own expense completely showed on the Plaine de Gennevilliers the agricultural value of the sewage manure for the raising of vegetables; but the difficulty thus to some extent solved, the increase of population has produced a larger quantity of sewage than can be utilised, and the question remains still to be settled. It can be understood that the proposal to flood a portion of the beautiful forest of St. Germain with the reeking manure, however valuable, has roused tempests of indignation. In the meantime the city continues to pour out daily its thousands of cubic yards of sewage. New drains are yearly laid,—it is not long since that almost every street in Paris seemed blocked with huge drain-pipes and piles of excavated earth. Paris, which possesses hard upon 500 miles of sewers, is still but very insufficiently supplied, and half as many miles of streets have still to be provided with sewers. As for the question of the branch pipes to each house, that much-disputed point remains as yet as unsettled as it seems in every country. Theory after theory is put forward, and progress is to some extent made, but to every thoughtful mind the inconveniences and dangers of the present system must be apparent.

At this time, when we know so much of unhealthy dwellings, it may not be uninteresting to mention the powers of the Paris Municipal Council in the execution of the existing laws upon unhealthy dwellings. In the first place, the council nominates a special commission to visit the site reported, when, if repairs or demolition be necessary, the landlord is required immediately to act. If the commission requires an outlay that appears exaggerated to the councillor of the parish, the question is reconsidered by another special commission, which may again refer the matter to the commission of unhealthy dwellings. The action of the council, it will be seen, is exercised as much in the interests of the landlord as of the lodger. The grounds for declaring any dwelling unhealthy are laid down as the following:—Air vitiated by emanations from ill-ventilated closets, the seats of which are not closed by an automatic cover, and the walls of which are not painted with zinc-white; insufficiency of light, either through smallness of the place or the limited size of the openings, dampness of ceilings and walls, as shown by stains, by the paper falling in shreds, or by mould on the woodwork; stagnant water caused by the bad paving of courtyards, by the want of properly sloped or cleansed gutters. It is is the power of any one, through letter to the mayor of his parish, to complain of the unhealthy nature of any lodging occupied either at the time or previously. The parish doctors are also called upon to make known if the want of proper hygienic precautions may have caused in any way the death of any person they may visit. Attention is invariably paid to any complaint when well founded.

Paris, like every great modern city, finds the disposal of its yearly increasing dead a constant source of difficulty, and there already exists a proposal for the establishment of a necropolis at a considerable distance from the capital, but connected with it by a special railway,—a place resembling, in fact, our Woking Necropolis, only at a much greater distance from the capital, but Parisian public opinion is against the idea. The Parisians like at times to visit the resting-place of their dead, and this distance,—hard on thirty miles,—it is urged, would interfere with a long-established custom. The fact remains none the less, that some steps will have shortly to be taken to set the question at rest. The subject of cremation is constantly violently agitated in council. In the meantime, the dead continue to fill silently the few still vacant spots reserved for them under the walls of the capital. A word, before leaving this subject, on the very different system from ours which prevails in Paris of burying the dead, and in which the municipality take no small share. The statement of the death once duly notified to the local *mairie* or town-hall, a certified doctor later in the day verifies the decease, after visiting the body. At the *mairie* where the death has been stated, a complete arrangement is made,—in a special department for the purpose,—for the funeral, which usually follows the day after the death. This arrangement is a simple matter of expense, there being a series of eight or ten classes, if we mistake not, in which the expense varies from 60*l.* to a few shillings. The simple order once given to the (municipal) official of the "*pompes funèbres*," the necessary sum paid, the plot of land purchased for the grave (an equally simple matter, the purchase being for ten years, or for perpetuity), the sad business is completed. The following day the officials of the "*pompes funèbres*" arrive, the funeral service is duly performed, either by the *curé* or the Protestant clergyman, as the case may be, and with a propriety not always known in our country, the sad duties are performed to the dead, a little procession files through the streets, each person uncovering as the hearse passes by, and soon earth is given to earth, dust to dust. Only those English persons who may have borne the affliction of a loss away from home in the great city by the banks of the Seine can conceive the simplicity of the Paris undertaker's duties, and the singular absence of that clashing jar on the feelings which seems so invariably to accompany the performance of such duties in this country.

In another article we shall treat of the public thoroughfares, their sweeping, lighting, paving, &c.; the omnibus service, the charity organisation, education, and the budget of the Paris municipality.

a

---

* See vol. xli., p. 746.

† Those who are desirous of further information we may refer to an excellent paper on the subject which recently appeared in the *Cornhill Magazine*.

* At the end of the seventeenth century it is calculated that the half million of inhabitants were supplied each with 3½ *litres* (considerably under a gallon) of water.

† The "*Grand égout collecteur*" is the largest work of the kind in existence, the *Cloaca Maxima* only being comparable with it. From its starting-point under the Place de la Concorde it runs three miles to Asnières, with a slope of about 19½ in. to every five furlongs (50 centimètres to the kilomètre), a breadth of about 18 ft. 6 in., and a height of about 15 ft.

THE FIREPROOF CURTAIN IN THEATRES.

In our second notice of the report presented to the Austrian Society of Architects and Engineers on the Vienna fire,* we referred to a supplementary report,† drawn up by a sub-committee of that society, on a fireproof curtain. The subject being of very great importance, we now give an abstract of the report. The construction of the proscenium opening and the party-wall separating the stage from the auditorium differing but little in modern theatres,—leaving dimensions, of course, out of the question,—the arrangement proposed by Herr Pfaff is one which may serve as a type which may be applied in any theatre. It ought to be premised that the protective curtains at present employed, especially wire curtains, are only useful in keeping back the flames from and preventing burning objects falling into the auditorium, for a time, and until, it is supposed, the spectators have left the house. But they are entirely useless in protecting, permanently, that part of a theatre if once a fire has broken out on the stage. Nor do wire curtains prevent smoke penetrating into the auditorium. The curtains of corrugated sheet-iron are somewhat safer, because they effectually shut off smoke and fire, for a time. It is a very great question, however,—and, indeed, there are no cases on record where such partitions have saved the auditorium from destruction,—whether even the latter description of curtains can withstand the intensity of a stage fire, and effectually prevent it laying hold of the other part of the house. The scheme proposed by Herr Pfaff is to serve two purposes: it is to afford absolute safety to human life, and it is to preserve the other part of the theatre, always supposing that the fire breaks out on the stage. The committee who reported on Herr Pfaff's proposal say that it is a happy solution of a difficult problem. After these few preliminary remarks, we may enter into the details of that gentleman's scheme.

The Curtain.—This consists of iron sheets bent in segment form, and carried by a horizontal series of hanging ties, which are secured at the top to an iron frame. The curtain is suspended to four wire ropes, and is nearly balanced by a counter-weight. Should the wire ropes give in case of fire, the upper frame-piece would settle firmly down on both sides along its entire length, so that the curtain then rests on permanent supports. The curtain, always presupposing a fire on the stage, is turned with its sheet-iron side towards the fire, and with the hanging-ties towards the auditorium. The sheet-iron segments being bent away from the hanging-ties, the latter are, with the exception of the few places where the segments are fastened to them, surrounded on all sides by the air of the auditorium, and cannot therefore be heated to a temperature which would jeopardise their firmness. The bent iron sheets (like the protective sheet-iron of fire-proof doors) are exposed to the flames; but as their thickness is 1·5 millimètre (nearly 0·06 inch), their entire destruction is out of the question. The segmental form of the iron sheets supplies the required stiffness to the curtain. The sheets may become deformed at a red-heat, notwithstanding that they are cooled by the air of the auditorium; but the curtain as a whole cannot collapse, because the hanging-ties, which form the supports, are removed from the fire, and cannot be changed in form. The curtain is consequently, to a certain extent, a double one of rational construction, and it may be expected that it will resist even the fiercest conflagration on the stage side. The curtain is provided at its sides with iron frames, which serve as guides, in the wall jambs, and thus provision is made for closing the whole safely, the suspension of the upper frame-piece serving the same purpose. There would be no occasion to mask the whole construction, should it be decided to leave it open to the view of the public before the commencement or at the end of the representation; but should it be deemed desirable to let the curtain down during the *entr'actes*, the iron construction ought to be withdrawn from view from artistic motives. But in that case it must be insisted upon that the curtain should not in any way be covered with anything that would prevent the access of air, and thus annul the effect of the whole construction.

The Frame.—The proscenium-opening is on the side of the stage surrounded by an iron framing, consisting of two pillars and an exposed cellular girder. The pillars are of wrought or cast iron; the girder is wrought iron. As these parts, in case of fire, have to hold and support the curtain, and as they are exposed to the direct effect of the fire from nearly all sides, it is necessary to protect them in some measure from becoming too greatly heated. This it is proposed to do by making the pillars as well as the girder water-tight, and connecting them with the water-mains of the theatre, so that the entire hollow frame is filled permanently with water. The horizontal girder, however, is provided at the top with several short tubes turned towards the curtain, and plugged with easily fusible metal. In case of only a moderate heat (say 100° C.) the plugs would melt away, and leave openings for the escape of the steam and afterwards the water. Owing to the pressure from the water-mains, a continuous circulation would then set in, by which the frame would be cooled, and, according to the extent of the supply, water-jets be discharged upon the upper part of the curtain, which evidently would be of great advantage. The hollow frame would, in case of fire, be in the condition of a steam-boiler provided with safety-plugs. It is presupposed that the part below the stage level is walled up, so as to make it fireproof, the only communication between the two basements being a fireproof door. The space above the proscenium opening, if it is not already walled up fireproof, should be made so by a double sheet-iron shield filled in in the manner of fireproof safes, which would fully provide for the perfect safety of this part of the partition.

The Motive Power.—Entirely disregarding the usual methods of winding up and letting down the customary wire or sheet-iron curtains by friction-brakes or similar moderators, Herr Pfaff proposes to work his curtain by hydraulic power, the pressure being supplied by the water from the mains. The arrangement consists, broadly, of hydraulic tackle, constructed in the manner of hydraulic cranes and lifts. The curtain is drawn up by water-pressure. To let it down, the water is withdrawn. The curtain falls under the influence of the excess weight, the speed of the descent as well as the gradual stoppage being regulated by cutting off the water. In the arrangements proposed, all necessary arrangements are made for governing and regulating the machinery, so that, if it is once erected and fitted up, it may be worked by simply turning a small hand-lever, which is to be placed at a convenient spot near the curtain. At the same time, a similar easily-worked lever should be placed at another convenient spot, perhaps in the auditorium, so that the curtain may be let down independent of what may happen on the stage. As a matter of course, the descent of the curtain is to be announced by an automatic bell apparatus. By using hydraulic power, the manipulation of the curtain will be greatly facititated; indeed, it may be as safely and as conveniently worked as an ordinary hydraulic lift.

In the arrangement proposed by Herr Pfaff, the iron curtain will lose the character of a contrivance adapted for cases of urgency, and become an essential part of the daily routine in theatres. The committee are of opinion that this is the only true principle; for in the case of other arrangements there exists always the fear that they may fail in the hour of need. Hydraulic machinery has up to the present time been found the most efficient, and it will prove so also in the case of iron curtains for theatres. Only in the case that the water supply should fail, the curtain will fail; that is to say, it cannot be drawn up, or it descends by itself. The committee think that in such a case the public should not be permitted to remain in the theatre. The committee are finally of opinion that,—

(1.) An iron curtain erected in the manner above described would perform the daily service required safely and without hindrance;

(2.) That the arrangements as designed promise durability and undisturbed working;

(3.) That the means for shutting off the stage from the auditorium supply the possibility of being put into operation quickly at the outbreak of a fire;

(4.) That the same, if applied at the right time, afford sufficient protection to the public against death by fire, should it break out on the stage; and

(5.) That the arrangement, so far as it may be made effective by a rational construction, will hinder the fire penetrating the proscenium opening, and thus confine it to the stage, thereby saving the rest of the building.

* See page 187, *ante*.

† Report of the theatre sub-committee on the projected fire-proof partition submitted by Mr. Carl Pfaff.

THE DECAY OF MONUMENTAL SCULPTURE.

From time to time regrets are heard that the age in which we live is unfavourable to sculpture, and that, consequently, the sculptor's occupation is largely gone. But it is a fact that there is just as much occasion for monumental sculpture now as at the beginning of the century, when Flaxman was working with the fullest vigour, or even in the times of the Renaissance and its preceding years, when the Italian sculptors greatly occupied themselves with monumental work. It is strange, therefore, to find that monumental sculpture has fallen considerably into disuse, although it is one of the most legitimate modes of using the sculptor's skill, and one of the most suitable to and most in harmony with ecclesiastical architecture. No one desires to see the kind of monuments spring up which were so common in the eighteenth century, and of which our cathedrals contain such numerous examples. The expiring warrior in full regimentals, supported by a classic Muse, or a portly lady pierced by the arrow of a typical Death, offends our taste. The allegorical and inflated and unreal style, of which we suppose all our readers can call to mind examples, and which is a wretched sequel to the beginnings of modern sculpture, which dates from the Renaissance, is not only vicious in itself, and wholly without merit as true art, but has done not a little to disgust the present generation with monumental sculpture. The pure and classical works of Flaxman are so few compared to those which were turned out of the studios of Bacon, Banks, Nollekens, and other artists, much inferior both in talent and powers of execution to these, that they have not redeemed this species of sculpture from the discredit which has now overtaken it. But because an age which has left rather more monuments than we want should have been a period in which a vicious style prevailed is no valid reason why, at the present time, when a purer style of sculpture has grown up, although it may not be one of much power or individuality, monumental sculpture should be put on one side with a certain amount of contempt. There is likely in a short time, it is true, to be a recumbent statue of the late Dean Stanley in Westminster Abbey, but this is comparatively an isolated instance at the present day of the use of monumental sculpture. But it is not necessarily in large and, consequently, expensive works, such as life-size, recumbent statues must be, that this kind of sculpture should be executed. The modest and artistic bas-relief is an admirable mode of erecting a monument at once lasting and beautiful; and few better opportunities can occur to an artist of feeling and power for showing the stuff of which he is made. Any one who has studied either Flaxman's completed works, or the numerous casts at University College, will at once have before his mind many illustrations of this fact. It is true every one of our sculptors is not a Flaxman; but, without attaining to his rank, it is possible for a modern artist to execute a work which shall be technically admirable, and express with artistic propriety and genuine feeling the ideas upon which it is based. That sculpture in churches is not at the present time "in fashion," can, we suppose, hardly be doubted by any one who will take the trouble to go into the matter. That sculpture is not an art essentially secular, is, we presume, also without doubt; and therefore it must to some extent be a matter of surprise that it is so little seen at the present day in our cathedrals and churches. To some extent, the adoption in recent years of stained glass in this country, and the growth of what are popularly called "high art" ideas, have had something to answer for in preventing the use of monumental sculpture. Moreover, the High Church movement, and the decoration and the adornment of our churches which have been so largely influenced by this movement, are not in sympathy or in harmony with sculpture. The High Church decoration and sentiment are essentially florid; monumental sculpture is, or should be, exactly the reverse. It is simple and unadorned. When, therefore, we have these ideas and fashions prevalent; when we bear in mind how degenerate monumental sculpture had, broadly speaking, become at the beginning

of the present century, it is not difficult to see abundant reasons why it should to a considerable extent have been greatly abandoned by the present generation. But these again are not valid reasons why monumental sculpture should not still be employed. In itself it is an art which should always fill, if we may say so, a practical place, and which may be at once artistic and suggestive. Again, what a field is open to it in the cemeteries, which now become commoner every day. Why should they not become not only our burying-places, but likewise spots beautified and dignified by art? Our climate is, unfortunately, not one in which marble stands well, and therefore there may be urged practical objections against sculpture in our open cemeteries; nevertheless there are some species of marble which are not so much affected by the weather and climate as others, and these might be well employed. Bronze is more or less unaffected by climate, and therefore there is no reason why this metal should not be employed by those who can afford to erect substantial and lasting monuments. But inside our churches, at any rate, marble is safe, and here, as we have already pointed out, bas-reliefs are available as most proper means of perpetuating the memory of those who are gone. If the present neglect of monumental sculpture should continue, it will be a matter of regret, not only for the sake of English art, but also because it deprives many of a kind of memorial which is singularly in harmony with ecclesiastical buildings, and fitted to be a dignified and lasting record of the dead.

ART CLUBS ABROAD.

THE recent visit of H.R.H. the Prince of Wales to the home of the Savage Club has revealed to the world at large the existence of an artistic association which, though it has now been formed a quarter of a century, may be said to have been little known outside a certain circle, large it is true, but still comparatively limited. The fact is characteristic in a measure of our country, where it must be remembered the somewhat professed Bohemianism of the "Savages,"—Richard Savage, though of noble origin, was a thorough specimen of the tribe,—has never held the position accorded to it abroad. There have existed, of course, from all time, such convivial gatherings of professional brethren. In the history of Italian art the *cazzuole* of the Early Renaissance are not unknown,—those friendly meetings to which the artists, such famous men as Donatello and Ghiberti, used to bring each, on a certified day, his own special and self-made dainty subject for the approval of his brethren.

Our Savage Club has not unfittingly been said to resemble in some sort the well-known Paris *Cercle de l'Union artistique*, better known as the *Mirlitons*. Nicknames seem to attach to popular clubs; the club in the Rue Volney is familiar to Parisians under the free-and-easy title of the *Crémerie*; but the aims of both these associations are, it must be admitted, somewhat higher than those of the "Savage." In their handsome Louis Quatorze apartments in the aristocratic Place Vendôme, the *Mirlitons* yearly organise, a few weeks previous to the opening of the *Salon*, a select exhibition of the pictures intended for the Palais de l'Industrie, and the club in the Rue Volney has long rivalled its more exclusive neighbour in exhibitions of this kind. At the present moment both these exhibitions are open, and in the Paris season they hold high their position among the attractions of the spring months. But it is not alone exhibitions that are held by the *Mirlitons*; for few of the fashionable gatherings of the season are invitations more eagerly solicited than for the *Mirlitons* when some well-arranged concert or clever comedy is performed on the boards of their well-adapted theatre. Bohemian in no way are the *Mirlitons*, though with not a few of the best elements of the good-fellowship of Bohemianism. In addition to the exhibition, concerts, and comedies, a certain sum is yearly voted for the publication of literary and musical works and the purchase of pictures, and their reproduction by engraving or lithography. The aims of the *Cercle de l'Union artistique*, as it is officially termed, are it will be seen, marked and decidedly of a high order; those of the rival *Crémerie*, the *Cercle artistique et littéraire*, being scarcely less ambitious or praiseworthy. Were it not that our Burlington Club has organised within past years such an interesting series of exhibitions, it might, indeed, be brought against our city of clubs as a reproach that we possessed no association to be compared with the *Mirlitons* or the *Crémerie*, to which recently a fresh rival has risen in the *Cercle des Arts libéraux* in the Rue Vivienne, where at present is being held a charming exhibition of works by lady artists. In Paris there are not wanting clubs very much like the "Savage"; but we are afraid our Prince could scarcely, even in the strictest *incog.*, visit the homes of revelry and enjoyment that hang about the artistic heights of Clichy and the Quartier Latin.

Oddly enough, artistic club life has not seemed to flourish well in Rome. It is true that for many years there has existed a German Artists' Club, the friendly character of which is worthy the closest imitation. Many must be the agreeable recollections connected with this club with visitors to Rome, from crowned heads downwards, but English artistic club life has not flourished in the city of the popes. In what artists are apt to call the old days of Rome, in the days even as late as the liberal pope Pio Nono, the Papal Government did not encourage social gatherings of a club kind, and the eminent resident English artists, Gibson and others, were very unwilling to do anything to disturb their friendly communications with the Government, so that whenever an English Artists' Club was suggested, the plan generally fell through, though there are not a few English artists, and at the head of whom is the present P.R.A., who must remember with pleasure, not unmixed with the recollection of some anxiety, how the English Artists' Club struggled through its early years of existence. We rather fancy that the somewhat mercenary character of artistic life in Rome rendered *the* club a little indisposed to encourage artistic membership; or, perhaps, the members allowed themselves too easily to be overshadowed by the great names of Michelangelo and Raffaelle to admit of a wider sympathy with the smaller men.

Every stranger who has visited Düsseldorf knows the *Malkasten*; it would not require the presence of jovial "Fritz," the Crown Prince, for the Savage Club of Düsseldorf to become known to travelled Germans. Faithful to their motto,—

> "Erst mach dein' sach,
> Dann trink und lach,"—

and under the ægis of their arms, the double-headed eagle grasping in its talons in lieu of the orb and sceptre, a latch-key and a beer-mug, as typical of late hours and good fellowship, the members of the *Malkasten* pass happily their evenings in the historic gardens they occupy, once the home of the philosopher Jacobi, who has often entertained here Gœthe, Herder, the Princess Galitzin, and many others of that famous band to whom German literature owes its reputation. The club, if we mistake not, is hard on forty years old; from the first it bore the characteristic name of the *Malkasten*, or paint-box, containing every possible variety of colour and shade represented in its members, as from the diversity of his box the painter is able to produce his one harmonious whole. Founded on the principles of genuine German good-fellowship, the *Malkasten* has prospered to this hour. Jovial are its ordinary gatherings in the summer in the old gardens round which lingers, as it were, the spirit of the good old times; and in the winter, in their new club-house, superb indeed are the fêtes that are given from time to time in the richly-decorated rooms, where all the resources of the friendly society of Düsseldorf artists are brought into play as is only proper in a club whose protecting patron is Albert Dürer. Brilliant, indeed, is a *garten feste* in the pleasant summer evenings by the Rhine, and thoroughly at home does the English visitor feel himself amidst the cordial welcome of half-countrymen of his. The *Malkasten* of Düsseldorf is, of course, an exceptional club; but throughout Germany, in all the art-centres, in Munich, in Weimar, in Berlin, in Vienna, there are clubs of a similar nature, where good fellowship is ever the order of the day. Indeed, there breathes in the *Künstler-verein* of the Fatherland a friendly spirit of artistic companionship that it is to be regretted is sadly absent in our country. Our few art-clubs (let us not forget as belonging to the same order the Lotos in New York), though England is the land of clubs (the very word has been imported into most of the foreign languages), cannot be said to be the genuinely social and professional gathering-places such as exist abroad, where the very word "artist" is understood in a wide sense scarcely familiar in our country, and where the sculptor, the architect and the painter, the musician, the poet, the literary man,—every one who does his work truly, honestly, and with an ideal, is ranked justly as an artist. Let us hope that the recognition by our popular Prince of the Savage Club may tend to spread wider abroad the spirit of brotherly good fellowship which constitutes the chief characteristic of the club in the Savoy.

THE CANAL INTEREST AND THE BOARD OF TRADE.

AN influential deputation, representing the canal proprietors of Great Britain, had an interview with the Chairman of the Board of Trade on the 15th current, in order to request the opposition of the Government to the Bill now promoted by the Midland Railway Company and other parties for the purchase or conversion of canals.

Out of 4,350 miles of canal in this country, some 1,700 are already in the hands either of railway companies or of their covert agents. The result is that the canal transport, to which England owed so much of her prosperity fifty years ago, is in many places virtually closed, and the traffic is forced upon the railways. But it has been distinctly proved that for all objects of such low value that it is not worth while to pay an extravagant price for speed, carriage by canal may be effected at from one-third to one-fourth the price possible by rail. On the Continent this is not only known, but acted upon, and the information which the canal-owners are now collecting on the subject in England is of a very serious character. Some of the principal trades of England are being transferred to Glasgow or to Paisley, owing to the superior cheapness in transport, both of raw material and of finished goods, afforded by the Clyde. Pig iron has long shown this influence. Heavy iron castings from Shropshire, and steel rails from Sheffield followed. Now the shoe trade is leaving Stafford and Northampton for the Valley of the Clyde; and finally, the cotton-thread trade is leaving Lancashire for Paisley. "Scotland, a correspondent writes, "is beating England hollow by reason that the rails there are held in check as to their charges by the waterways. Thus, food and raw materials come more cheaply, and goods are sent away with corresponding advantage." The question of the utility of the canals in keeping the railways in check is thus becoming fully appreciated by the freighters. What is most essential now is for the railway proprietors to be made to understand that by grasping the traffic for which speed is of no object, they are injuring their own resources as well as the manufacturing industry.

Mr. Chamberlain said that the Regent's Canal Bill was in contravention of the Canals Act, which prohibited the transference of a public water-course to the control of a railway company. In spite of this, however, Parliament had permitted such transfer, on the condition that the navigation should be maintained, an appeal lying, in case of infraction of this condition, to the Railway Commissioners. But no such right of appeal has prevented the locks on the Wey and Arun navigation from being pulled down, the bricks from being sold as old materials, and the bed of the canal from being turned into meadow land. Nor is the navigation of one or two of the old main lines of lucrative water traffic, now owned by the railways, in a much better condition. As the object of the Regent's Canal Bill is to fill up the waterway and convert it into a roadway, it would better befit the Board of Trade to oppose the Bill at once, than to trust to its purport being defeated by subsequent law proceedings, after Parliamentary sanction had been obtained to something (which would depend on the wording of the clauses of the Bill) which might defeat the proviso referred to altogether.

In the case of the Thames and Severn Canal Bill, the power to destroy a link in the water connexion between these two great inland waterways was avowedly sought, although only by cutting a few yards of canal. As to this, the Board of Trade will oppose. The reply to the deputation hardly gives the impression that the vital importance of the subject was appreciated by the Board of Trade; but there is certainly a greater public disposition now manifested to look the subject fairly in the face than has been observable since 1834, or thereabouts.

We understand that some of the gentlemen interested in this matter have called in an engineer, long familiar with the subject, to

report on the relative cost of canal and railway carriage. Such a report, if adequately drawn up, must have not only a national but a European interest. We trust that we may have an early opportunity of presenting its main features to our readers, as from the hands to which it is entrusted we think it pretty sure that it will fully and impartially enter into all the elements of the comparison.

UNIFORMITY IN BUILDING AND SANITARY REGULATION.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the meeting of this Institute on Monday evening last, Mr. Ewan Christian, vice-president, in the chair, the discussion on Mr. Boult's paper* was resumed.

Mr. E. C. Robins pointed out that the subject was not then being discussed for the first time in that room. On the contrary, it had been on several occasions under discussion, and more particularly in connexion with the Architectural Conferences of 1876 and 1878.† In the last-named year Mr. Douglass Mathews read a paper before the Conference on "The Model By-Laws as the Basis of a General Building Act,"‡ and Mr. Boult also contributed a paper § on the subject to the proceedings of the same Conference, at which, also, some notes on the subject by Mr. Honeyman, of Glasgow, were read.‖ At the previous Conference, *i.e.*, the one held in 1876, Mr. Clarke and Mr. Honeyman also read papers ¶ on the subject, and these and the other papers named were very fully discussed. These discussions were, in part at least, due to the fact that the Local Government Board had had under consideration a code of building by-laws applicable to the whole country, and which were intended to serve the purpose, tentatively, at least, of a Building Act applicable to the whole country. During the four years which had elapsed since 1878 the subject had received further attention, and had been more closely approached, and it was to be hoped that it would be further discussed and considered at the next Conference. The Institute had already taken steps in the matter, in pursuance of a resolution passed at the Conference of 1876. Mr. Boult's paper, therefore, was but a return to the discussion of an important question which had already been very fully discussed, and was perhaps, a preparatory step to its rediscussion at the next Conference. Mr. Boult in his paper had drawn attention to what he called four axiomatic principles, and had suggested that any General Building Act which might be passed ought not to be confined to mere matters of construction and materials, but should also be a sanitary Act. Mr. Honeyman, on the contrary, had strongly advocated that the two objects should not be dealt with in one Act. Whether they were both sought by one Act, or whether they were dealt with in two Acts, it was of the first importance that the clauses of any Act or Acts should be drawn up on broad principles, defining hard-and-fast lines in as few directions as possible, in order not to hinder improvement and justifiable variation in the details of construction, and so as not, at the same time, to unduly interfere with the freedom of action of the local authorities where freedom of action might safely be left to them. Under the head of "Laying out Land for Building," Mr. Boult spoke of density of population, which must be taken into account, whether calculated by area or by cubic space; but whether one or the other, there was no doubt that close packing of the people was an injurious thing. Dr. Farr had shown that the nearer people lived together the shorter were their lives. Dr. Playfair had shown that, whereas, before the Fire of London, the death-rate in the City was 80 in the thousand per annum, after the City was rebuilt the rate of mortality was only 40 per thousand; while at the present time the death-rate of London was only a little above 20 in the thousand. He thought it was not wise to ignore a broad general principle of that kind, even though certain instances might be quoted which seemed to disprove its soundness. As to unbuilt areas at the backs of houses, it surely could not be advantageous to have no back areas to houses? No widening of streets in front would ever compensate for the want of light and air at the backs of houses, unless the houses were only one room deep and built back-to-back. Perhaps a back street 20 ft. wide or so might in some cases be advantageously substituted for the back areas. To pass to another point, Mr. Boult had said in his paper,—and it was a strange thing for an architect to say,—that it was useless to provide means of ventilation for people not intellectual enough to use them. Such a recommendation seemed to augur but ill for the future. Were architects, then, to work down to the level of their constituents? Should they not rather seek to work so as to educate their constituents? "Count not thy brother a reprobate," said the proverbial philosopher. Architects ought certainly to look forward to uplifting the tastes and sanitary knowledge of the people for whom they built. As regards damp-courses, Mr. Christian at the last meeting made some very practical remarks as to the way in which they might be dealt with under certain circumstances. Mr. Boult had made some sweeping assertions under that head. He said, "In the absence of any really scientific investigation into the effects of damp-courses in walls, of laying concrete all over a building site, and of covering drain-pipes with concrete, it was not possible to show their sanitary necessity; and such nostrums of superstitious empirics should not be enforced on those more familiar with structural requirements." Now, on the part of builders, very probably there was an absence of scientific investigation. Architects had, however, paid some attention to the subject, but they were modestly content to acknowledge that it was to the researches of the medical, chemical, and physical professors that they were chiefly indebted for their knowledge on the subject. As a member of the committee of the City and Guilds of London Institute for the Advancement of Technical Education he had lately had an opportunity of inspecting the laboratories of Switzerland, Austria, and Germany. While in Munich he visited Dr. Pettenkofer's museum, called the Hygienic Institute. He afterwards spent two hours with Dr. Pettenkofer's chief assistant, and examined the results of experiments on building materials and sites, and the processes by which those results were arrived at. Among other points demonstrated by the experiments to which he was referring was the fact that the air in the ground beneath a cellar or basement of a house was under a higher pressure than the air in the cellar itself, involving also the fact that the ground air was always in motion. These results conclusively showed the necessity of the precautions as to covering the site with concrete, for where the soil was polluted the air entering the house from the ground in the basement would also be polluted. Other interesting experiments as to the porosity and permeability of materials were also witnessed by him, all of them fraught with valuable lessons to the sanitary constructor.

Mr. J. Douglass Mathews observed that, as Mr. Robins had truly said, the matter under discussion was not a new one to the Institute. The matter of the Model By-laws and the proposed General Building Act had been very fully considered on two separate occasions, viz., at the Conferences of 1876 and 1878. Mr. Boult's paper had brought forward many of the arguments used on those occasions both *pro* and *con.*, as well as embodying new points quite worthy of discussion at the present time. He fully agreed with Mr. Boult that many of the requirements of the By-laws, though reasonable enough in themselves, would be somewhat arbitrary if transferred to and made part of a General Building Act; but it should be remembered that the By-laws had been drawn up with the idea of keeping in check the more unprincipled of the speculating builders, rather than having for their primary object the assisting and promoting of all good and proper building. It seemed to him that the result was very unsatisfactory, for although some speculating builders required to be held with a very tight rein, those who desired to build in a proper manner had unnecessary restrictions put upon them by the By-laws. Mr. Gordon Smith, in his remarks at the previous meeting, said it was the architect's business to get over difficulties. True, but when Acts of Parliament were under discussion, to talk about getting over difficulties in them sounded rather like an incitement to evasion of the provisions of Acts of Parliament,—ways of getting over difficulties which should certainly not be attempted by architects. It was quite possible to make Acts of Parliament relating to building so clear and distinct, and at the same time so reasonable in their requirements, that there should be no difficulty in having them properly carried out. The Model By-laws were very fully discussed not only at the Conferences, but by a committee of the Council of the Institute, in response to the invitation of the Local Government Board. That committee held fourteen meetings, and every clause of the By-laws was very carefully considered, and many suggestions for their improvement were made to the Local Government Board. Many of these suggestions were adopted, either in whole or in part, but there were others of equal importance which had been completely ignored. The Local Government Board, perhaps, hardly gave that deference to the suggestions which they deserved, considering that they emanated from the Institute. Those who were in the habit of working under and enforcing the Building Acts were perhaps better able to appreciate difficulties and defects in the Acts than the Local Government Board. It was one thing to put building regulations on paper; it was quite another thing to carry them out in their entirety. Mr. Boult's paper raised a great many points of great interest. If the Model By-laws were to be taken as the basis of a General Building Act, every point deserved careful consideration. He agreed with Mr. Boult that the By-laws entered too much into detail to serve as an Act of Parliament, and that an Act of Parliament should deal with building matters in a general way, leaving it to local authorities to make by-laws under the Act, such by-laws varying in different localities, according to soil, climate, and materials. Mr. Boult had advocated that the business of the builder should be as open and as free from restrictions as that of the hatter and the shoemaker; but he (Mr. Mathews) could not agree in that view. No doubt, greater freedom from restriction would enable builders to erect cheaper houses than at present, but was cheapness of first cost the only consideration, and were badly-built and unhealthy houses really cheap at any price, however small? He thought not. A person who bought a hat for a small price only injured his own interests if the article proved to be bad, but a builder desiring to manufacture houses cheaply could not possibly live in and use all the buildings he ran up, and even if he could it was questionable whether, in the public intest, he should be allowed to perpetrate bad building, and then to suffer the consequences in the shape of disease. Houses were built for other people to live in, and it was to the interest of the speculating builder of the worst sort to build them as poorly as possible, and to get as much for them as he could. Surely such a method of planting colonies of disease and squalor, and consequently of pauperism and crime, should not be allowed to go on without restriction? On the contrary, he held that it was one of the most important duties of the State to provide securities for healthy dwellings for the people. The public had also other rights capable of being secured by a Building Act; for instance, they had a right to expect that buildings should be erected in such a way as that accidents should not be likely to happen. With regard to areas at the backs and sides of houses, the By-laws not only required areas of a certain extent, but of a certain minimum width,—a stipulation which very often rendered building in a town a very serious matter. Again, there was no reason why such areas should be continued to the ground if the ground-story was lighted by a skylight and not used as a dwelling. In reference to what Mr. Robins had said as to damp-courses, it was often of very great consequence not only to provide horizontal damp-courses, but, as the Chairman had suggested, vertical ones, because, while the By-laws proposed by the Local Government Board rightly insisted that a house should not be built upon a site the surface of which was covered with fœcal or vegetable matter, there was nothing to prevent such horrible stuff from being used to fill in the trenches outside and in contact with the main walls of the house. In view of such facts as those to which Mr. Robins had alluded, the danger of such a proceeding was very great. Reference had been made in the paper to the subject of concreting over the area of a house, Mr. Boult saying that it was not required in all circumstances. One of the recommendations of the Institute to the Local Government Board was, that there should be a layer of concrete 4 in. thick well rammed, all over the site of every dwelling-house, except when the foundation was of rock, clean gravel,

* See *Builder*, p. 156, *ante*.
† Fully reported in the *Builder* volumes for those years.
‡ *Builder*, vol. xxxvi., pp. 583 *et seq.*
§ *Ibid.*, p. 610. ‖ *Ibid.*, p. 611.
¶ *Builder*, vol. xxxiv., pp. 594, 634.

or dry sand. A great deal of care was taken in the Model By-laws with regard to sanitary matters, but their requirements in regard to such matters could not and ought not to be strictly insisted on. Although it was only a few years ago since the By-laws were issued, sanitary science had made advances, and more was known now of the true principles of sanitation than when the By-laws were first issued. Was it necessary, was it desirable, that an Act of Parliament should contain the minutiæ of sanitary details? He was very glad at the reference made by Mr. Boult to the means to be taken to secure the proper laying of drains, and he thought that the Local Government Board or the local authorities might be responsible for the appointment of competent persons to see to the proper laying of drains and issue licences to such persons, who alone should be employed by local authorities to supervise the laying of drains. In his paper on the subject read before the Conference in 1878, he urged the same view. No mention was made in the By-laws as to the strength of timber or iron to be used in building. In the Liverpool Building Act, he believed, certain scantlings of timber were prescribed for certain uses, as well as certain strengths of iron. It would be interesting to know how those provisions of the Act had been found to work. It appeared to him that it would be very difficult to frame tables of scantlings of timber or strengths of iron that would be of any very great use in the constantly varying circumstances of practice. And upon what principle should such scantlings and strengths be fixed? The minimum scantlings and dimensions that would be sufficient where good materials were used would be insufficient where bad materials were employed, and the fixing of an unnecessarily high minimum of scantlings and dimensions would be unjust to those who employed good materials. Mr. Boult thought that the provisions of the Local Government By-laws as to walls were complicated. He could not agree with him, although the walls were unnecessarily required by the By-laws to be thicker than under the Metropolitan Building Act. Even with the bad bricks and bad mortar so largely used in the metropolis, accidents to walls were of comparatively rare occurrence, proving, as he thought, that the dimensions of the walls were ample for stability. Under the By-laws, cross-walls were to be carried up to the top of the topmost story of a building. Now the topmost story under the By-laws was a rather extraordinary story, for the space in the roof between the tie-beams and the collars was defined as a story, thus making an ordinary two-story building into a three-story one. The Institute Committee before mentioned had suggested that the top story of a building should be defined as the upper story in a building when it was constructed so as to contain a living or sleeping room or rooms. But this was one of the suggestions which had been passed over. Many local codes of building by-laws were unreasonable in their requirements as to the deposit of complete sets of plans, sections, and even elevations. Such exactions upon the building-owner were unreasonable, and, where an architect was employed, wholly unnecessary. As to the administration of a General Building Act (if such were ever obtained), he thought that in large towns the building surveyors should be practising architects, as men of the best abilities, and who were rendered independent by their practice, could always be found in large towns. In small towns it was, no doubt, necessary to have salaried officers. But the men appointed to supervise buildings under a Building Act or Building By-laws, whether paid by fees or by salary, should in all cases be duly certified building surveyors, who had passed a proper examination. Probably the body who should be entrusted with the conduct of those examinations and the granting of certificates of competency was the Institute itself. While he wished to see localities retain the management of their local affairs in their own hands, because he thought centralisation should not be carried too far, yet, at the same time, the central authority should be left a certain power of control. Mr. Boult's suggested court or board of appeal, if carried out, would be most valuable as a means of bringing recalcitrant authorities to book. One defect of the Model By-laws, considered as the basis of a General Building Act, was that they made no provisions as to public buildings. The By-laws, prepared in accordance with a section of the Public Health Act, contained no provisions against danger from fire and other matters that should come within the scope of a Building Act. If a General Building Act were really desired, it would be well to discuss the matter in detail at the next Conference. In the meanwhile, if the Institute could put itself into communication with the public bodies and with building surveyors,—with all, in fact, interested in carrying out such an Act,—great advantages might result. He did not think that any other body was so well qualified to take the initiative as the Royal Institute of British Architects.

Mr. Robert Rawlinson, C.B., said he had not read the whole of Mr. Boult's paper, neither did he come prepared to speak on the subject, which was one to which he had paid some attention. He felt bound to say that he agreed with the observation that had been made that any Building Act which was to be a general Act must give a very wide range of latitude as to materials and details of construction if it were to meet with acceptance. He also agreed in thinking that it was not wise to aim too much at centralisation. But it should be recollected that a General Building Act, intended to be applicable to all places, must be framed and carried out by means of what was termed centralisation. It should be remembered that the Model By-laws, about which so much had been said, were issued by the Local Government Board merely as suggestions. Speaking of his own department, every document that had been issued under his own hand had been termed by him "suggestions" for such and such a thing, because he knew how difficult and how impossible it would be for him, whatever his knowledge might be, to dictate to those who were carrying out works under conditions the whole of which could not possibly be before him. A perfect Building Act could not be made, but one that would be most acceptable would be one drawn up in the spirit, *i.e.*, one giving general instructions upon which by-laws should be framed to suit particular localities. In such an Act structural details should be gone into as little as possible. In framing by-laws under such an Act for special departments of work, the same care should be taken as was taken by the Local Government Board before confirming By-laws as to water and sanitary fittings, to prevent undue preference in specifying appliances. Very frequently a country surveyor, instead of specifying in the By-laws sent up to be confirmed a particular type of water-closet, service-box, or valve, specified one particular variation of each type of appliance. Such a course was manifestly unjust and impolitic, because it was playing into the hands of the maker of one special variety of article, there being, perhaps, a dozen varieties of the same type quite as good and as cheap as the one singled out. As to the sites of houses, he did not know how any general law was to be framed. He constantly found houses built on sites which it was impossible to sewer and drain properly; but if all building on such sites were to be prohibited, the effect would be to stop the growth of many towns,—perhaps most properly. Take the case of London itself: how many scores of acres of buildings which were built on sites which must inevitably be condemned if such a rule were to be laid down? All that portion of the East of London known as the Isle of Dogs was below the high-water level of the river; so was all West Ham and a great portion of Bermondsey. Local By-laws had to be carried out by Local Boards. What were Local Boards, and how were they constituted? Who were the persons who got themselves elected upon them, and were we quite sure that all those gentlemen who gave so much time to the management of local affairs did their work free, gratis, and for nothing? Had they no interests, direct or indirect, to serve? Had they nothing to do with buildings erecting or about to be erected? It would be found that a great portion of them were interested in building, or were owners of cottage property already erected. The first Public Health Act provided that the Local Board might appoint their own surveyor, but that he should not be dismissed by them without the consent of the central body. That provision was of course intended as a protection to the surveyor, so that he might do his duty fearlessly. But there was such an outcry against the "domineering" power of the central Board, that when the Public Health Act was renewed, that clause was rejected, and Local Boards could now discharge their surveyors without any hindrance. The whole of the country was divided into urban and rural districts, and the rural districts were empowered to carry out works of sewerage and water supply just as the urban districts were empowered. The rural and urban authorities sent up plans to the Local Government Board which very frequently gave no idea whatever of the nature of the works intended, and which in point of drawing would disgrace a fifth-form boy at school. Such plans were submitted in order to obtain the sanction of the Board for raising the funds to carry out the works. The Board was not an executive body, and had no establishment and no means of making proper plans for the execution of the works required. The Board had issued some broad general instructions on the matters of water supply and sewerage, but they were only issued as suggestions, and were intended for the perusal of educated surveyors. Yet the Board was accused of raising barriers to sanitary progress because it did not, and could not, give its approval to improperly drawn-up plans. He was constantly being met with the statement that there ought to be more absolute power to do certain things, as, for instance, to take possession of other people's property when it was required for public purposes. Was it to be expected that any Government would give such arbitrary power to any and every local authority? He did not know anything worse than action under the Lands Clauses Consolidation Act—did not know of any process quite so costly, so wearisome, and so cumbersome. Under that Act it was quite possible to spend about 5,000*l.* in litigation over a sum of not more than 500*l.* Many times when he had been summoned to serve on arbitrations it had made his heart ache to see, on the first day of the proceedings, a room filled with barristers, lawyers, and engineers arrayed on either side, one set prepared to swear one thing and the other set prepared to swear quite another thing,—the first day's costs being greater than the sum in dispute. It was quite time that such a state of things was remedied. He might be accused by some people of wishing to spoil "business." No doubt, few things were so profitable, either to lawyers, architects, or engineers, as to be summoned to attend a good "rattling" arbitration, but he thought that most right-minded people who had witnessed such proceedings as those to which he was referring would condemn such a roundabout and costly way of settling such disputes. With regard to areas in the rear of buildings, it would be a good thing if in any General Building Act provision were made that existing areas should not be abused. He knew towns which were absolutely shocking in that respect. They had been built and re-built. No town was more mismanaged with regard to its buildings than Liverpool some twenty-five years ago or more, when "jerry" builders were allowed to run up batches of courts which gave it an unenviable notoriety. He had himself bought some of that property, and endeavoured to do his duty by it; but one-third of the rent went regularly in repairs and maintenance. He had heard it said, "Don't interfere with the thickness of the walls!" That depended upon the bricks and mortar used. The joists used in many buildings were miserably deficient. Surely some law was wanted to reach that sort of thing! At any rate, when laws were made, let them be properly administered. The most perfect Acts of Parliament and by-laws would be of no avail if not carried out; and their being properly carried out depended largely on the integrity and earnestness of the local authorities. This discussion would, he hoped, do good in drawing attention to the great importance of the subject.

Mr. Goldstraw, Building Surveyor to the City of Liverpool, said he had been a little disappointed at not hearing more said on the question of uniformity in building legislation. It seemed to be taken for granted that some sort of General Building Act would sooner or later be imposed on the country, but speakers did not appear to be quite clear in expressing their views whether a General Act was advisable or necessary. Did the architectural profession generally wish for such an Act? In his opinion such an Act would be a very great boon to the country. In Liverpool they had a Building Act which had been in existence for forty years. That Act differed materially from the Metropolitan Building Act, and architects practising in the metropolis who had to erect buildings in Liverpool frequently made very serious and costly mistakes in consequence of the dissimilarity of the two Acts. That sort of

confusion prevailed, more or less, throughout the country, for there were very few places which could be said to agree at all in their building regulations. He was sorry to have to say it, but it was his opinion that architects were too apathetic on the question. The multiplicity of varying building regulations all over the country must involve great loss of power, and a great deal of confusion. In his opinion, the architectural profession ought to be grateful, to say the least of it, to the Local Government Board for taking the trouble to frame the Model By-laws, and for seeking to get them adopted, so as to bring about some approach to uniformity of practice, which must be the basis of any General Building Act. But the Model By-laws, taken as the basis of a proposed General Building Act, were deficient in what he thought to be some essential provisions. Under the Liverpool Building Act the scantlings of timber for floors and roofs were very clearly specified. The omission of such particulars in the Model By-laws was, in his opinion, a serious defect. He agreed very fully with Mr. Boult in saying that the provisions of any Building Act intended for use throughout the country should be very general, but he did not agree with him when he said that the ingredients of mortar ought not to be specified in such an Act. The Liverpool Act required that mortar should be composed of not less than 1 part of lime to 3 parts of clean sharp sand. If that requirement was not met, the builders were summoned. Unless the ingredients of mortar were defined by the proposed General Building Act, it would be impossible to get the magistrates to convict the users of bad mortar; for the question would be raised, What is mortar? Therefore, any vague mention of mortar in the Act would not prevent the use of bad mortar. With regard to the appointment of officials to see that the proposed Act was properly carried out, Mr. Boult was in favour of the system which had long prevailed in the metropolis, which was, he thought, justified by results. He referred, of course, to the system of appointing district surveyors. Now he (Mr. Goldstraw) was of opinion that such a system, if introduced into Liverpool, would be most pernicious and unworkable, and Mr. Aldridge, President of the Liverpool Architectural Society, was of the same opinion. He thought that the same objections that applied to pluralists in the Church and to polygamy in social life applied with more or less force to the system of district surveyorships in vogue in London. That system, which prevailed before the Metropolitan Board of Works and the Metropolitan Building Act of 1855 were called into being, had been perpetuated apparently for convenience sake.

Dr. Thorne-Thorne, of the Medical Department of the Local Government Board, said that he had always prided himself on belonging to a profession the members of which had, he thought, in common with architects and engineers, done something for the promotion of the public health. Mr. Boult's conclusion that "the present deplorable state of sanitary science" was due to the medical profession, was, however, a rude awakening. He would say, however, that he had no hand in the preparation of the Model By-laws,—did not see them, in fact, until they were issued. A great deal had been said about concreting the sites of buildings, Mr. Boult being of opinion that such a requirement was a very arbitrary one. Mr. Robins's remarks had, however, shown the great importance of such a provision. One speaker had said that such a provision was not necessary in cases where the soil was a dry gravel or sand, but in his (the speaker's) opinion it was very essential that the site of a house should be concreted where the soil was of a porous nature. He had constantly found that outbreaks of fever had occurred in houses which were admirably built and apparently well attended to in the matter of sanitary requirements. What was the cause of such outbreaks? Simply that the leakage of a drain belonging to some adjoining premises had found its way into the beautiful bed of gravel which formed the site of the house, and this, not being concreted over its surface, had, when the house was warm and shut up close at night, given off deadly exhalations to be breathed by the inmates. It was, he thought, incontestable that phthisis and typhoid fever could be largely prevented by the concreting of basements. He was sorry to hear Mr. Boult speak in condemnation of open areas in the rear or at the sides of houses. They might not always be properly kept, but, notwithstanding, their advantages were great. He was greatly surprised at Mr. Boult's suggestion that means of ventilation should not be provided for people not intelligent enough to appreciate their advantages. Surely it was not desirable for architects to conform to ignorant prejudices? It was rather their duty to seek to educate the people into an appreciation of sanitary necessities. One of the most encouraging results of the issuing of the Model By-laws by the Local Government Board consisted in the educational effect which they exercised on all local authorities who were desirous of doing their duty in protecting the public health.

Mr. E. B. Ellice-Clark, Borough Engineer of Hove, said he regretted to hear Mr. Boult say that in a General Building Act it would not be necessary to give any definition of mortar. It was his (the speaker's) duty, on a recent occasion, to prosecute two builders for using what they called mortar, but which was certainly not deserving of that name, seeing that it was made up of about ten parts of loam to one of lime. Unfortunately, the Building By-laws of the town gave no definition of mortar, and among those who gave evidence in favour of the builders were two members of the local body of Commissioners, who, in opposition to the evidence of their own officer, said that the "mortar" in question was very good, and fit to be used in putting up rubble walling. That case was illustrative of the difficulties under which borough surveyors often had to work, and he was therefore of opinion that unless mortar was defined in any proposed General Building Act, it would be impossible to get a conviction. It was a mistake to suppose that building by-laws defining the quality of materials were made to control architects. The fact was that 95 per cent. of the buildings which had come under his notice as a borough official were erected without any supervision by architects, who, as a rule, built far beyond the requirements of local by-laws. In West Brighton, where a great many large buildings were being erected on land which cost 8,000*l.* an acre, he had found no difficulty in carrying out the provisions of the Model By-laws. He was glad to be able to say this, because when the By-laws were under consideration at one of the Conferences referred to, he had spoken disparagingly of them. Further consideration and experience had, however, led him to change his estimate of their value. As to the deposit of plans with borough and local surveyors, he thought that architects made a little too much of the matter. Speaking for his own class, the borough engineers, he would say that they were, as a rule, men of intelligence and professional ability, and not men of a class who could justly be accused of appropriating or wanting to appropriate the ideas of architects. If they wanted architectural details, they could get them in abundance for a very small sum from the illustrations given in the professional journals. It should be remembered that without the deposit of adequate plans it was impossible for a borough surveyor to control the actions of speculating builders. Any General Building Act should deserve its title, and should be administered by means of by-laws suited to the necessities of different localities. It would be impossible to frame by-laws too stringent to cope with the malpractices of the jerry builders, but by-laws suited to London necessities would not do for Liverpool, neither did they want on the chalk cliffs of Ramsgate all the provisions needed in the Valley of the Derwent. It would be a great mistake to insist too strongly on details in an Act of Parliament. If ever a General Building Act were passed, he trusted that Mr. Rawlinson would urge upon the Local Government Board the necessity of including in the measure some means of protection for surveyors who had to see to the administration of the Act,—protection in the form of some sort of appeal against the infliction of hardship upon them because they sought to faithfully carry out their duties.

Mr. John Hebb, Assistant Architect, Metropolitan Board of Works, said he should have thought that Mr. Boult would have advocated some increased stringency in the law rather than have voted for its relaxation. It was, he thought, rather too late in the day to deny the necessity of having walls built of bricks of a certain description, and with mortar of a certain quality. He had also thought that the time had gone by for denying the advantage and necessity of covering the sites of buildings with concrete, or for questioning the efficacy of a damp-course. With regard to the Model By-laws, as had been very well shown, they were put forward by the Local Government Board merely in the nature of suggestions, and did not become operative until they were adopted by the local authorities, who might vary them or adopt them in their entirety, as they pleased. The provisions of the By-laws appeared to be minute, but that appearance was only caused by a desire to meet all cases and all circumstances. He had hoped to have heard something said about the Metropolitan Building Act, which, although it had done good service, was not considered by everybody to be quite perfect. He should have been glad to have heard from the meeting any suggestions for the amendment of the Act. He thought that the suggestion that there should be one uniform law for building regulation all over the kingdom was Quixotic. Difficulties would arise which would be insuperable, the differences in nomenclature of building materials alone being very great, even if what was called a story-post in London was not called a bressemer in the country. How could such uniform legislation be brought about? It was hardly to be expected that the Metropolitan Board of Works could take the initiative in the matter. Successive Governments, whatever their politics, had shown very little anxiety to deal with the subject. The last proposal to properly codify the existing building law as far as it related to the metropolis was proposed by the Metropolitan Board of Works in 1875, but the attempt resulted in failure, its most serious opponents being the district surveyors and the Institute itself. The measure then proposed was a very patient piece of work, and had been mainly drawn up by the late Mr. Newall, who had been engaged in the preparation of previous Building Acts. The changes proposed by that Bill were not very serious, but were aimed chiefly at consolidating the law. This year the Board was promoting a very timid Bill dealing with some of the points which the Board had been told more particularly required attention, such as the limitation of the cubical contents of warehouses, &c. In fact, the Board, finding it impossible to improve the Building Act at one *coup*, were attempting its improvement by instalments, of which those which they succeeded in effecting in 1878, giving them power to make by-laws as to sites and foundations, had, he thought, given pretty general satisfaction.

Mr. Henry Dawson thought it would be a mistake to assume that architects did not want a General Building Act. On the contrary, he thought architects as a body would welcome such a measure, provided that it did not enter into details, which must be dealt with under by-laws. That there must be by-laws was perfectly clear, in order to check the vile building always being carried on by what in Liverpool were called "jerry" builders, but who were better known in London as "mushroom" or "field" builders. But, surely, by-laws which were necessary to guard against the malpractices of such men should not be foisted upon architects, who were men of education and professional responsibility.

The Chairman, in closing the discussion, said he hardly saw why, if by-laws were necessary, architects should be above them. Such by-laws were to restrain dishonest and "scamped" work; why, then, should architects object to them? He had been disgusted with some of the vile work which was carried on in the suburbs of London under the name of building. As to the possibility of a uniform Act of Parliament relating to building, he did not at all believe in it. Mr. Ellice-Clark had, he thought, shown good reason for the deposit of plans.

Mr. Boult, in the course of his reply, said that reference had been made by Dr. Thorne-Thorne to his (Mr. Boult's) allusion to the medical profession. He did not speak in condemnatory terms of that profession, but he did think that when a medical man was afflicted with a craze for sanitary reform he was one of the most visionary and tiresome men that could be conceived. Dr. Thorne had spoken of overcrowding. How was overcrowding defined by medical men? Dr. Richardson, the great founder of the City of Hygeia, had said that there should not be more than five families, or say thirty persons, to the acre. On the other hand, the Peabody Trustees, in their new buildings, brought together 1,500 people to the acre, among whom the rate of mortality was only 17 per thousand, whereas the rate of mortality of London as a whole was 21 or 22 per thousand. Were the Peabody Trustees to be accused of overcrowding? After replying to various other points

mentioned in the discussion, Mr. Boult said he was forced to come to the conclusion that he and the elder members of the profession would have passed away, and the younger members would have become very grey indeed, before the Legislature passed such a General Building Act as he believed to be desirable.

The proceedings then terminated.

THE NEW IMPERIAL PARLIAMENT HOUSE OF GERMANY.

As we had anticipated, the competition opened by the German Government for new designs for the projected House of the Imperial Parliament, is confined to "German architects." The phrase is ambiguous, but it is interpreted to include any architects whose mother-tongue is German, or who are subjects of the German Emperor; and, accordingly, architects belonging to the German-speaking provinces of Austria, or the German Cantons of Switzerland, will undoubtedly be found amongst the actual competitors. With regard to the terms of the competition, they have been generally received in Germany with approval. There are to be ten premiums, divided as follows:—Two first prizes of 15,000 marks, or 750*l.*, each; three second prizes of 10,000 marks, or 500*l.*, each; and five third prizes of 3,000 marks, or 150*l.*, each. In addition to these the jury is empowered to recommend ten additional designs for purchase by the Government, at 2,000 marks, or 100*l.*, each. Moreover, the four German architects who won prizes in the first competition in 1872 are invited to participate in the present competition, and, in case they enter it, are assured an honorarium of 3,000 marks, or 150*l.*, besides the chance of gaining one of the ten,—or perhaps we should say twenty,—premiums. The total funds thus available for participants in the competition is 107,000 marks, or 5,350*l.*, an amount unprecedented in the history of such affairs in Germany. The novel method of distribution of prizes in this competition,—the fact that there are two first and three second prizes, besides five third prizes,—has given considerable satisfaction in architectural circles in Germany.

The time allowed for so large a task may seem too limited. The designs have to be sent in before twelve o'clock noon of June the 10th next, and this condition is to be enforced without any exception. The competition is to be anonymous, a motto being attached to each design, and the competitor's name enclosed in a sealed envelope bearing the same motto.

There will be a public exhibition of the designs only after the decision of the jury has been taken as to those which are to be rewarded or purchased. The jury is to consist of the committee of thirteen members appointed by the Imperial Parliament to carry out the project, together with eight professional architects who have not entered as participators in the competition.

THE DECORATION OF THE PANTHEON, PARIS.

THE paintings and sculptures ordered by the French Government for the decoration of the Pantheon include the following works:—"Attila and his Army before Paris," and "St. Genoveva exhorting the People to be Tranquil," both by M. Delaunay, 50,000f.; 2. "Scenes from the Life of Charlemagne," by M. Henri Lévy, 50,000f.; 3. "Scenes from the Life of King Clovis," and the same "King's Vow before the Battle of Tolbiac," by M. Blanc, 50,000f.; 4. "Preaching of St. Dionysius," by M. Galland, 20,000f.; 5. Marble Group of Three Persons, by M. Montagny, sculptor, 20,000f.; 6. "The Prophet Eli," by M. Mercié, sculptor, 20,000f. Besides the two last-mentioned sculptors, MM. Cavelier, Jouffroy, Cabet, Falguière, Frémier, Hialle, and Perrand, have been charged with the execution of statues of saints in white marble, the price agreed upon in each case being 20,000f. Some of the paintings and pieces of Sculpture here mentioned are already finished, others approaching completion. The Pantheon will thus, before long, present the spectator with a series of works by the best artists and sculptors of modern France.

The Town Council of Great Yarmouth, on Tuesday last, unanimously appointed Mr. J.W. Cockrill, of Glencoe House, Gorleston, Borough Surveyor, in place of the late Mr. H. H. Baker.

PASSENGER TRAFFIC ON RAILWAYS.

ALTHOUGH passenger traffic on railways grows greatly in periods of commercial prosperity, yet it knows usually a very great enlargement from period to period only in one class. The great volume of passenger traffic gravitates towards the lowest level,—that is to say, into the third class. In the past period, which is now being reported on, there has been a continuance of this feature marked in these columns some time ago. A few instances will fittingly illustrate it. In the case of the Great Western, we have to carry the comparison back over two years, because a year ago the accounts were furnished for five months only. But so contrasting corresponding half-years we obtain the following results. Great Western passengers:—

	1880.		1881.
First class	995,535	.....	1,056,885
Second class	3,795,346	.....	4,377,493
Third class.....	17,267,369	.....	19,143,587
Total	22,058,250		24,577,965

We have here, then, a general increase of about 61,000 in the first class; of 580,000 in the second class; and of the vast number of 1,800,000 in the third class,—an increase that is exceptional in being so distributed, as we shall see. In the case of the North-Eastern we have an increase of a very different character, as the following comparison will show. For six months ending each year named, the following were the numbers of North-Eastern passengers:—

	1880.		1881.
First class	539,175	.....	554,173
Second class	654,993	.....	629,494
Third class.....	14,526,108	.....	15,712,311
Total	15,720,276		16,895,608

This is, perhaps, the most striking decline of all. There has been in the total an increase of 1,100,000, but it has not been contributed to by all three classes. On the contrary, the second class shows a serious decrease, and this in the face of the fact that there was a reduction of the charges for first and second class fares. In the case of the upper class there is a slight increase, the great bulk of the addition having risen, however, in the lowest class. And it is notable that on this great railway the number of the second-class passengers is now far below what it was when the line was not half of its present size. Coming now to the return of the Great Northern Railway, we find a variation again in the character of the return. The following gives for the same two periods of six months the numbers of Great Northern passengers:—

	1880.		1881.
First class	513,369	.....	497,186
Second class	1,062,718	.....	1,075,724
Third class.....	10,066,323	.....	10,474,126
Total	11,642,410		12,047,323

The class that has decreased on this line is, it will be seen, the first class,—the second class passengers showing a small increase, and the great bulk of the addition arising in the third class traffic. A somewhat similar decrease is shown on the Midland Railway, where first class is shown to have suffered slightly, and,—there being no intermediate class,—the whole of the gain is in the lowest class. The following figures are interesting, as showing the number of passengers for the same two contrasted half-years. Of Midland Railway passengers:—

	1880.		1881.
First class	1,021,042	.....	982,337
Third class.....	13,435,681	.....	14,048,196
Total	14,456,723		15,030,535

This instance is a marked proof of the gravitation of travel downwards, although all that was possible had been done to retain it in its usual grooves. Finally, we may give, for the same two periods of six months, the following figures on passengers on the Manchester, Sheffield, and Lincolnshire Railway:—

	1880.		1881.
First class	142,131	.....	132,890
Second class	247,741	.....	234,581
Third class.....	4,895,494	.....	4,985,618
Total	5,283,366		5,353,089

In this instance there has been a decrease in the number of the passengers by both of the upper classes, and the third class shows an increase that counterbalances this, and gives the addition to the total that is observable.

It will be seen that the general testimony of the figures is to show a decrease in the number of the passengers travelling by the upper classes. In some instances, it is the first that shows the declension, but more usually the intermediate class suffers, and occasionally both. It will be remembered from our previous articles on the subject that the declension has been some time in progress, and thus it is clear that there is a great decrease in the number of passengers in the upper classes, and especially in the second-class passengers. It is true that in that period there has been a trading depression that must have aided the rapidity of the declension, but as against that is to be set the fact that the mileage of the railways has been largely increased, and that they have tapped fresh streams of traffic, and also that the total number of the passengers carried is far more than it was a few years ago, the conclusion must be drawn that second-class railway traffic is decaying, and, aided by the action of the Midland Railway, the public travelling on railways is gradually preparing itself for a division into two classes only.

NEWS FROM BERLIN.

THE opening of the Berlin *Stadt-Bahn*, or metropolitan railway, has been a great success. The rush of would-be travellers in the first few days was far greater than could be accommodated. There were 64,392 tickets taken on the first Sunday after the opening, and probably twice as many might have been sold had there been room for more travellers in the trains. Thousands were turned away from every station. With a little more time and experience of the habits of the population, the company will be equal to any demands that may be made upon it.

The opening of the line has given an extraordinary stimulus to house-building in the outskirts of Berlin. A very large number of building-plots have changed hands there within the past two or three weeks, at constantly increasing prices. It would be a great boon to the vast population if the extension of the means of communication should lead to the multiplication of small houses in place of the gigantic barracks in which most of the Berliners are lodged.

Another sign of the growth of the German capital has been the permission granted to a steam-ship company to run a regular line of passenger vessels through the city and down the Lower Spree to Spandau. It is said that English capital is invested in this enterprise, and that there are to be forty small vessels built in England for the use of the new company on the Spree.

Finally, we have to mention an interesting little fact in connexion with the Crown Princess of Germany (the Princess Royal of England). In the Hohenzollern Museum at Berlin there was recently deposited a marble bust of the German Empress. It was universally acknowledged to be a striking likeness, and the execution of the work is excellent. It is now announced that the bust is from the chisel of the Crown Princess, who had already distinguished herself, in many Exhibitions, by her paintings and drawings. By mistake, the Empress Augusta's bust has been attributed to the Crown Prince of Germany. It is really the work of his wife, the English princess, who has been doing for German art industry what her lamented father, Prince Albert, did for that of England.

ROMAN REMAINS NEAR LIEGE.

AN interesting discovery of Roman remains was made a few days back at Angleur, a village near Liège. Until this discovery it was not known that the Romans had ever had any settlements in the neighbourhood of the city in question. The remains consist of about twenty articles of ancient bronze. They were found, about 2 ft. below the surface of the ground, by a brickmaker's labourer. The majority of the articles are of excellent workmanship; the rest are of much rougher execution, but all are covered with a beautiful *patina*. The articles comprise two female statuettes; the statuette of a young man raising his hands to heaven; two other female statuettes; three Mercury heads with beard; two tiger heads; one lion with paw raised; piece of a rectangular tube; a Roman water-cock, &c. The workmanship of the statuettes is excellent,—vieing, in fact, with that of the most beautiful objects found at Pompeii. These objects are supposed to have been produced in Italy, while those of rougher execution were probably made near the spot. The tubes and other objects were found in layers

one above another; and it is regarded as almost certain that they formed part of a monumental fountain, adorning the garden or villa of a wealthy Roman. The judgment of archæologists who have seen the articles is that they belong to the age of the Antonines, or the third century after Christ. The proprietor of the objects is M. Emile de Laveleye, who has already exhibited them before the Belgian Academy of Sciences. It is hoped that the excavations, on the spot where they were found, may lead to further discoveries.

ST. LORENZO IN DAMASO, ROME.

Italy, the home of art, has of late been the scene of not a few restorations and threatened renovations, which appear calculated to show that in many circles in that country artistic feeling has died or is dying out. One of the most recent instances of the Vandalism of the restoration fever is reported by a German architect, M. Nienburg, as having been perpetrated in the Church of St. Lorenzo in Damaso, at Rome. Of this edifice, which is inclosed, together with the Cancellaria, in a common *façade*, the *Cicerone* says, "The Church of St. Lorenzo, as newly built by Bramante, presents still, in spite of some modern alterations, one of the most beautiful and peculiar interiors. It is a large vaulted rectangle, with avenues of richly-detailed pillars on three sides. Behind is the Tribuna, and the light comes almost exclusively from above, through the large semicircular window to the left. It is rich in picturesquely-lighted glimpses of various kinds, and is charming through the beauty of the space and the effect of the light." Of all this, according to Herr Nienburg, there is now hardly anything left. The vaulted roof has been replaced by a heavily-gilt cassette ceiling; while a monotonous side-light coming in from a number of round-arched windows only serves to show the tastelessness of the decorative work and the large glaring wall paintings. Those who have drawings or paintings of the church in its former state are informed that such works will now be worth much more than formerly. There are no photographs of the interior of St. Lorenzo as it appeared before this barbarous restoration.

THE GLOSSOGRAPH.

Herr A. Gentilli, a well-known member of the Austrian Society of Architects and Engineers, has invented an instrument which, based upon the physiological laws of language, and acting automatically, transforms the movements of the several organs of speech into visible signs, and thus fixes the spoken word itself, without the aid of another person. In this respect it differs essentially from the telephone and phonograph, which rest upon acoustic principles. The glossograph consists of an ingenious combination of delicate levers, which rest upon the tongue and lips of the speaker, and as delicate blades or paddles, which, placed under the nostrils, are vibrated by the out-flowing breath, in the same manner as the levers are set in motion by the movements of the tongue and lips. The levers and blades transmit the vibration to pencils which transcribe the several signs upon a strip of paper drawn along by a mechanical arrangement. The variety of these signs depends upon the nature of the vowels and consonants, to produce which the several organs of speech are called upon to perform their various functions. Similar to shorthand or stenography, a special system of writing,—it may be called glossography,—is created, which is based upon the principle of syllable construction and combination of consonants, and is especially suitable for being perfected for those languages the orthography of which differs least from the phonetic record of the apparatus. Amongst them may be classed German and Italian.

The instrument, as described, would seem somewhat delicate, and to require careful manipulation, but what its future may be cannot be said. We should add that in reporting proceedings in Parliament or courts of law it is not necessary that the speaker should use the apparatus himself. It is sufficient that a second person should manipulate, or, rather, articulate, it, by repeating in a low voice the words of the speaker, which is perfectly sufficient for rendering the signs distinct. The inventor has already had an opportunity of introducing the glossograph to a large audience of the Physico-Chemical Institute of the University of Leipzig, on January 29. The instrument was made by Messrs. E. Kraft & Sohn, of Vienna.

ST. CLEMENT'S CHURCH, CITY ROAD.

This church has been built in the midst of a thickly-populated district of small houses, and lies just off the City-road, between Bath-street, Lever-street, and Nelson-street, near the Eagle. The site is the gift of the Ecclesiastical Commissioners, and being a cramped one, the church does not stand east and west, but of necessity follows the lines of the site. The quasi west wall of the church is the party-wall between the church and the schools, which were built some few years since. One heating-chamber, beneath the south-west corner of the nave, serves for both church and schools. The church has been erected from the designs and under the superintendence of Mr. Butterfield, architect, and consists of a nave with a north aisle, a porch, and a chancel, with a transept, in which the organ is placed, and upper and lower vestries adjoining it. A bell gable, carrying two bells, surmounts the end wall of the nave. These buildings leave but little spare room on the site.

The total internal length of the church is 135 ft., of which 41 ft. belong to the chancel. The width of both nave and chancel is 28 ft. They are both roofed throughout at the same level. Double principals with tie-beams, bearing a large cross, and with traceried brackets springing from stone shafts, mark the division between the nave and the chancel. A turret staircase, entered by a door in the side wall, leads to the roof and the gutter. A passage formed between these double principals gives access as well to the gutters on the opposite side of the church. The walls are built of grey stock bricks, with Bath stone dressings. Black bricks are used in bands and patterns to relieve the brickwork externally, and red bricks, with a few black headers, give colour to the walls internally. The shafts of the arch between the chancel and the transept, and the shafts of the triple arcaded picture panel beneath the altar-window, are of dark Devon marble. This picture, formed in painted tiles, represents the Nativity, with the adoration of the shepherds on one side, and of the wise men on the other. The window above is filled with stained glass, chiefly grisaille. In the centre light is the figure of St. Clement; and in the two lights on either side are the figures of St. Peter and St. Paul. The large foliated circle in the window-head contains a representation of the Crucifixion, with the Virgin on one side and St. John on the other. Angels carrying censers appear in the smaller foil circles. The reredos is formed of traceried panels inlaid with coloured tiles. In the centre panel is a white marble cross, of bold design, relieved with gold, and enclosed in a vesica standing upon a Derbyshire fossil marble super-altar. A small amount of colour has been introduced on the stonework of the reredos, and also in the credence and sedilia recesses. Staffordshire tiles are used as a lining for the lower parts of the walls everywhere throughout the church. The floors beneath the seats are formed of solid wooden blocks, grooved and tongued, and laid herring-bone fashion. The chancel-fittings, the pulpit, and the Bible-desk, are of wainscot and walnut intermixed.

THE WATER GATE.

"The Water Gate" is the title given to a drawing executed in pen and ink by Mr. H. W. Brewer, and exhibited in the recent collection of works in black and white at the Egyptian Hall, Piccadilly. As will be seen from our reproduction, the drawing represents an old town of the German type, with a cathedral or abbey church in the middle distance, old walls and a gateway in the foreground, and a ruined castle in the distance. A rapid river, crossed by a bridge, rushes down from the hills and joins a larger stream in the immediate foreground. The structure, which gives the title to the drawing, is one of those low-covered and towered gateways which are found in many Mediæval towns, both at home and abroad, leading from the river to the interior of the fortifications. Traitors' Gate at the Tower and the Water Gate at Norwich are examples in point.

One of the chief objects of the artist has been to illustrate the kind of sites selected for town building by our Mediæval forefathers, and to which we have frequently alluded, especially in the descriptions given of Limburg-on-the-Lahn, Erfurth, &c.

The large church crowning the height has an apse with procession aisle surrounding it, but no radiating chapels; two towers crowned with spires rise over the transepts, and at the west end of the nave are two old Romanesque turrets.

The whole design shows a very extensive knowledge of German Mediæval architecture, and a most careful study of local peculiarities. This is indicated, especially by the gables and roofs of the houses, which are all of one type, such as may be seen at Boppard and that neighbourhood. The styles of architecture exhibited in the great church are in strict accord with the local traditions of the same neighbourhood. The artistic skill and merit of the work as a composition may be estimated from our reproduction.

THE CAPITAL AND COUNTIES BANK, ALDERSHOTT BRANCH.

The new premises for the Aldershott Branch of the Capital and Counties Bank (Threadneedle-street), which have been recently erected from the designs of Mr. Fred. Mew, of 30, Doughty-street, Mecklenburgh-square, are situated in the Victoria-road, at its junction with the Elms-road, facing Wellington-street. The building, which is of brick, with red facings, having the doorway, cornices, and other dressings executed in Dumfries stone, comprises accommodation for the residence of the manager. The telling-room, occupying the whole of the frontage, is paved with Minton's tiles, and has a ceiling of Messrs. Dennett & Ingle's fireproof arching, treated constructionally.

The works, including the mahogany counter and fittings of the telling-room, have been carried out by Mr. William Garland, builder, of Elms-road, Aldershott.

GLASS SHELTERS IN STREETS.

Sir,—When a lady gives a "reception," or any kind of party, it is becoming a custom, if it can be afforded, to protect her guests from the wet, by erecting a temporary portico, which covers the pavement, and thus to enable her friends to pass from their carriages into her house without discomfort and risk to health.

2. It appears to me that it would accord with increasing civilisation to have some tasteful permanent arrangement for getting into the house under shelter at all times, and I have suggested to Mr. W. H. Lascelles, the well-known builder of glass structures, to send me some designs for accomplishing this object, which I have his permission to ask you to insert in the *Builder*. I forward you three of these designs, and make the request in order that your readers and the public in general may be induced to consider the suggestion.

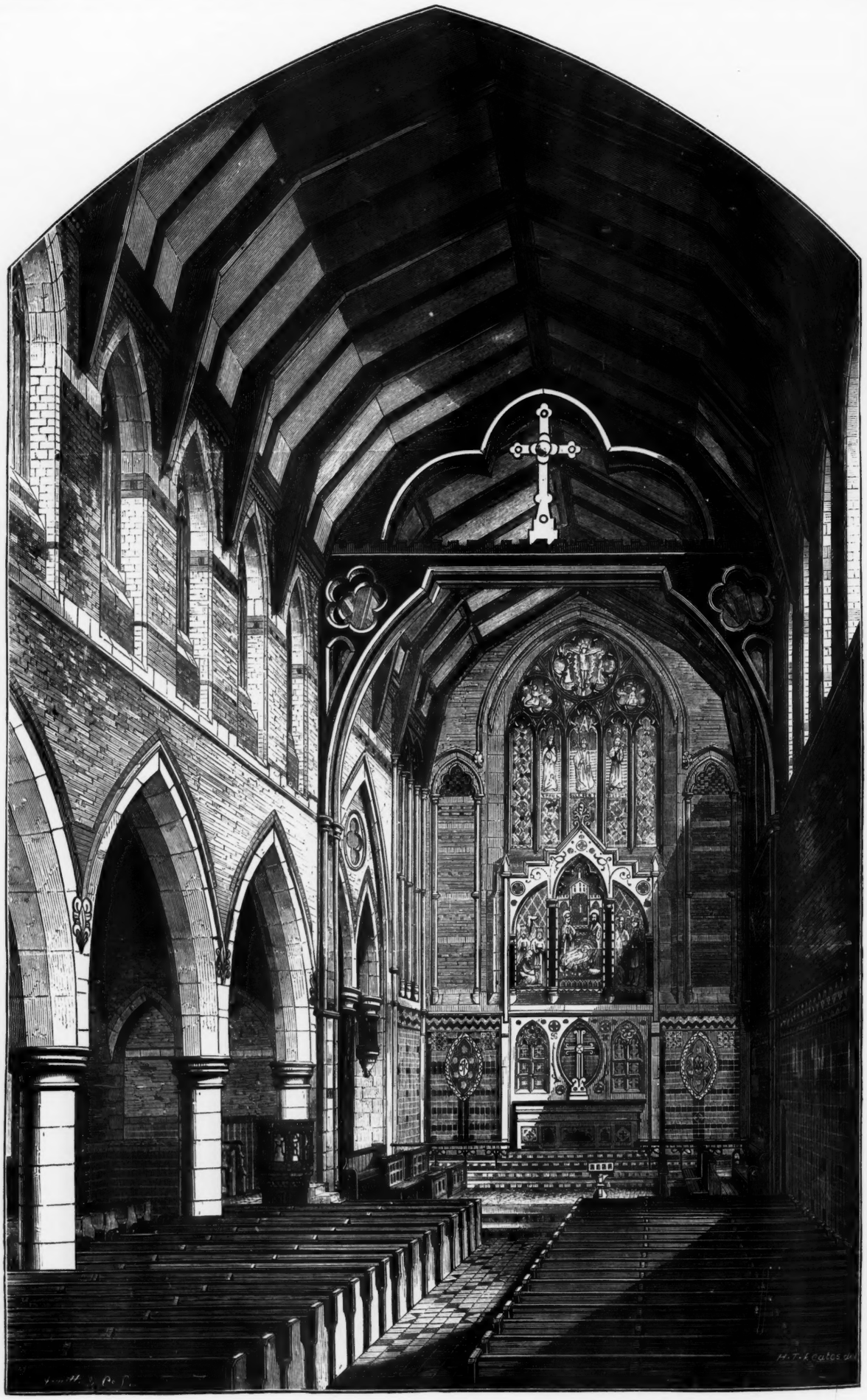
3. I am well aware that there are difficulties of various kinds which must be looked in the face. First, there is the Metropolitan Board of Works and its rules; secondly, there are the vestry authorities; and, thirdly, there are the neighbours on each side of the proposed structure; but I think all these parties will be guided in their views by common sense and public convenience.

4. I propose that these structures should be of glass and iron; that they should not allow of any dripping on the pavement; and that there should be no obstruction whatever on the pavement,—indeed, not so much as at present, as by a great umbrella held by a passenger; and that they should be ornamental, so relieving the dull monotony of street houses.

5. If you obtain from the public a favourable verdict on this suggestion, I will take measures for obtaining from the Metropolitan Board permission to try an experiment.

Henry Cole.

Mr. and Mrs. German Reed's Entertainment.—On Tuesday next, February 28th, Messrs. Alfred Reed and Corney Grain will produce a new entertainment in two parts, entitled "The Head of the Poll," written by Arthur Law, the music by Eaton Faning; and Mr. Corney Grain will give a new musical sketch, entitled "Not at Home."



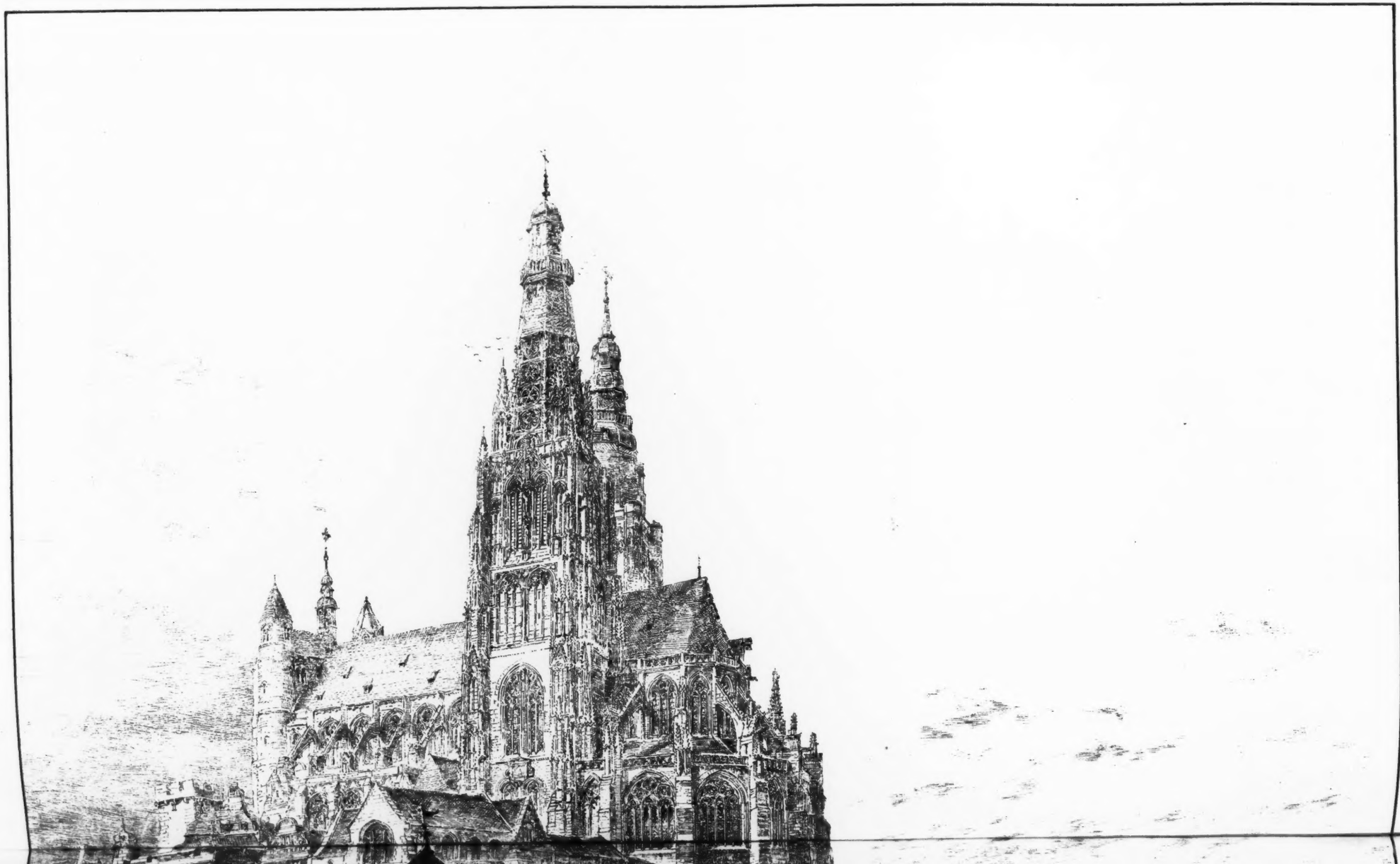
ST. CLEMENT'S CHURCH, CITY ROAD.—Mr. Butterfield, Architect.

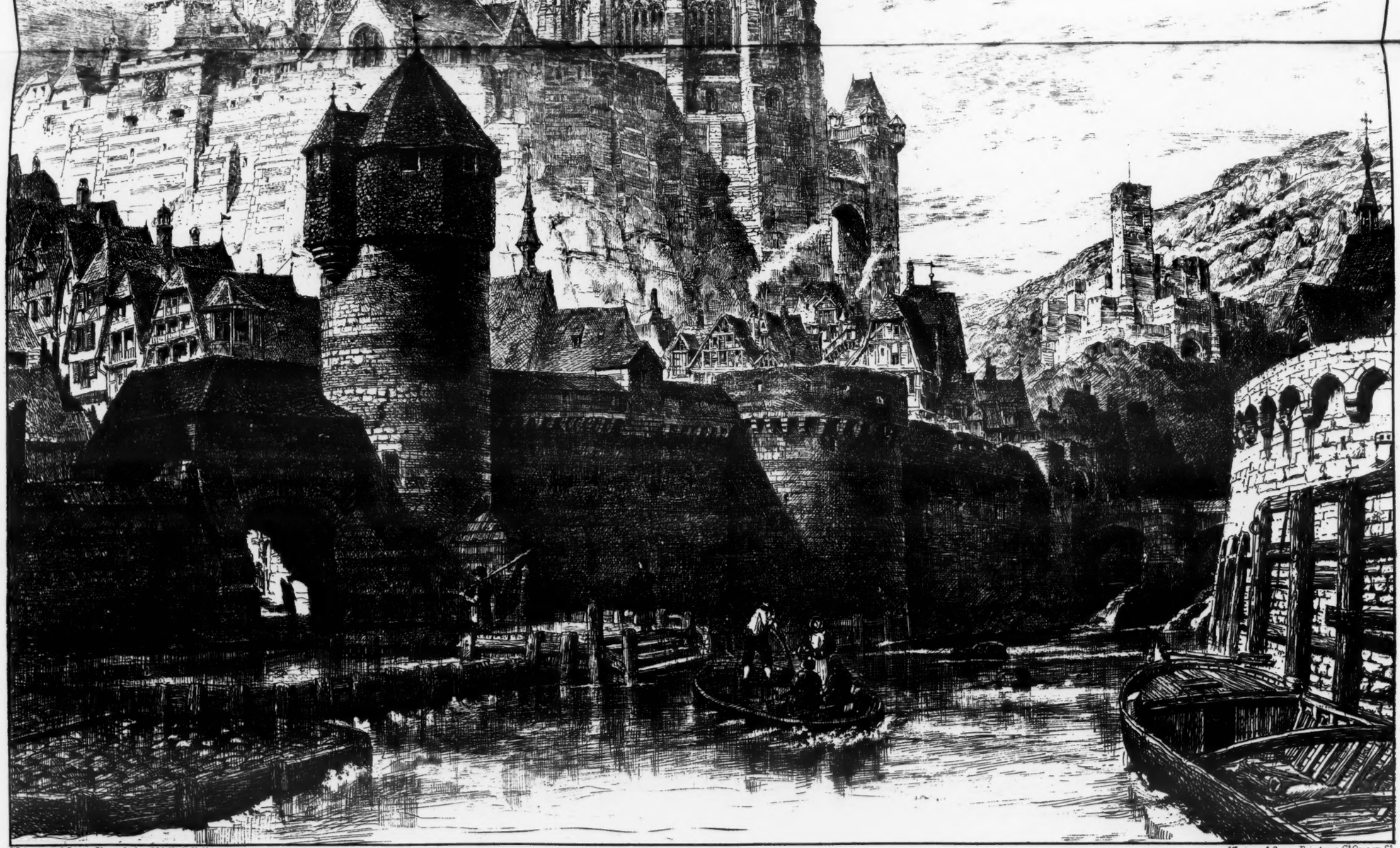
New Premises Aldershott Branch Capital & Counties Bank.

Fred. Mew, Architect.

C. F. Kell Photo-Litho London E.C.

Wyman & Sons, Printers, Gt Queen St.



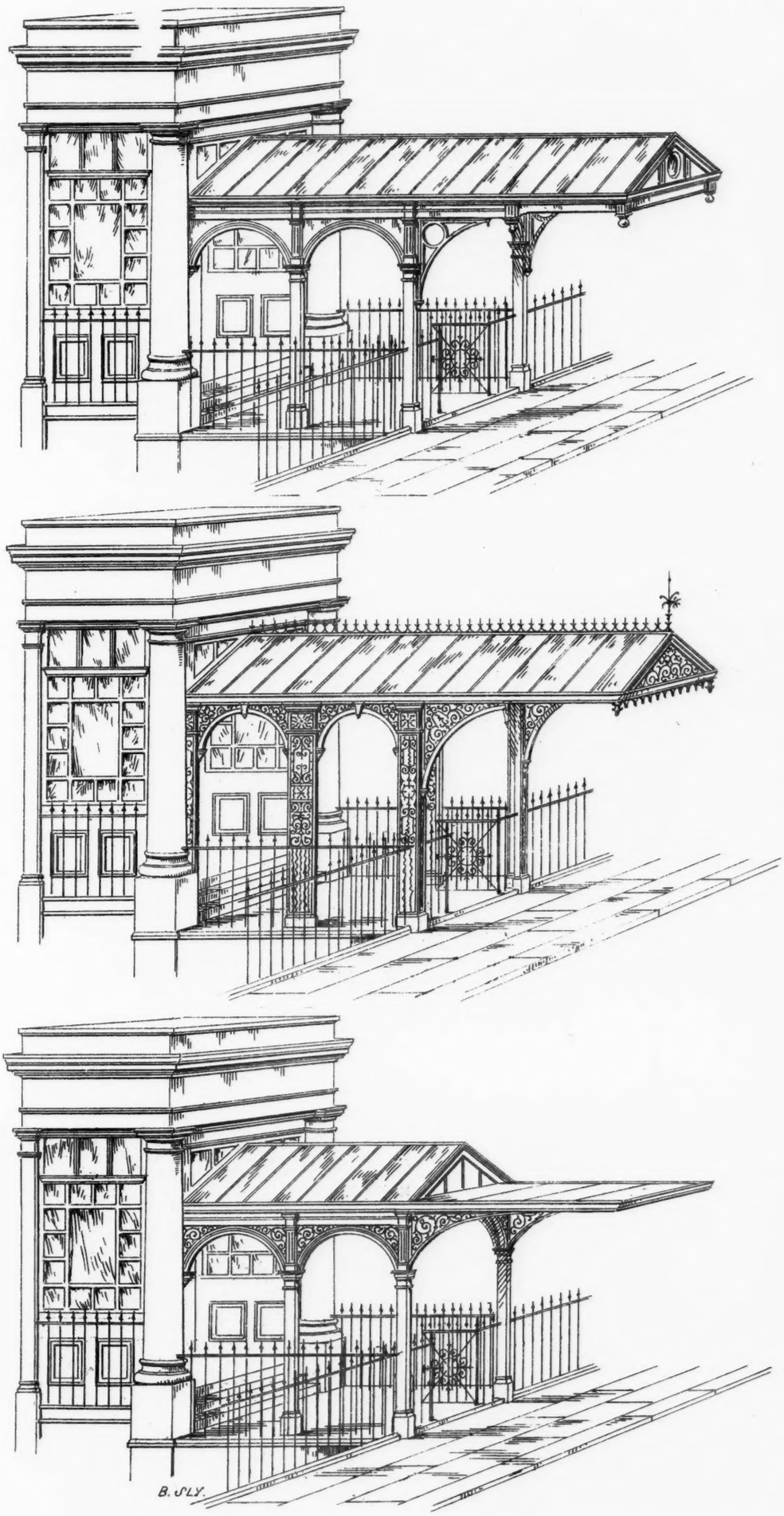


Whiteman & Bass, *Photo-Litho* 236 High Holborn.

Wyman & Sons, Printers, Cr Queen St.

THE WATER GATE: A Composition in Pen and Ink, by H. W. Brewer.

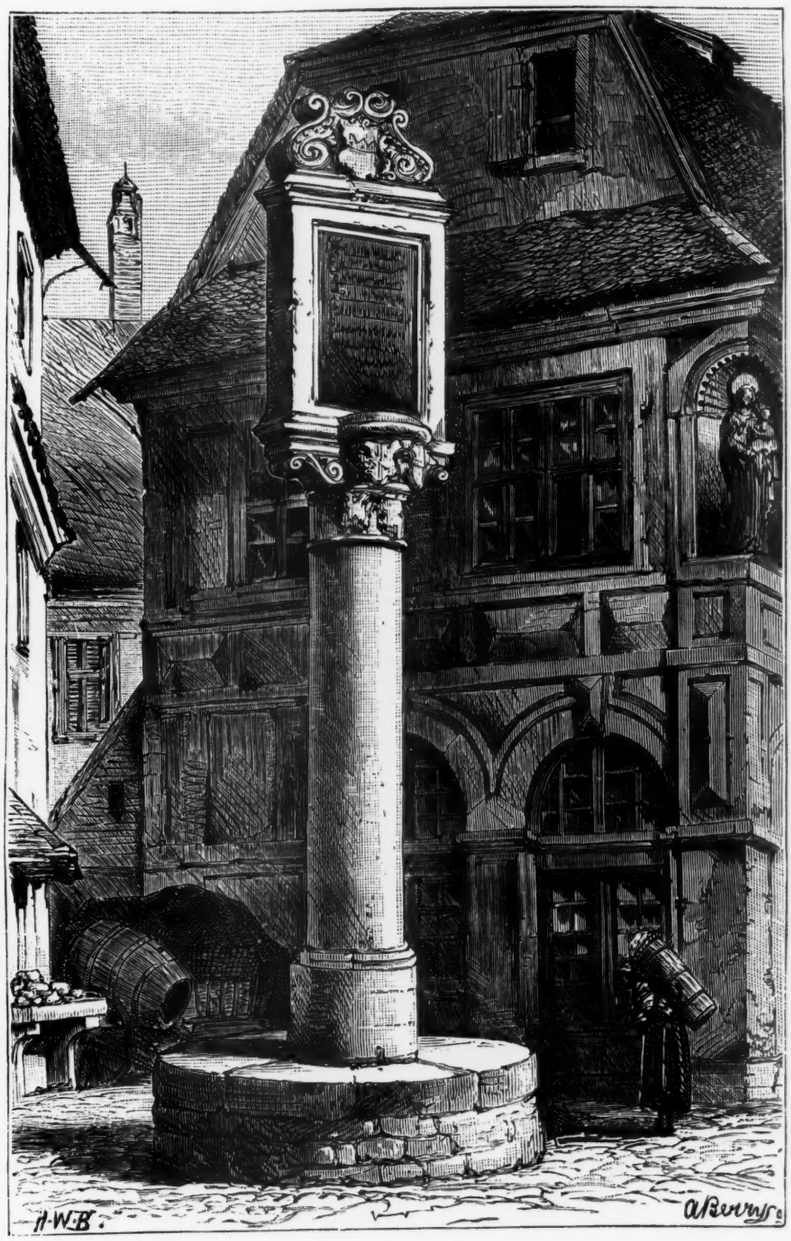
From the Black and White Exhibition, Dudley Gallery.



Bedford & Bass Photo-Litho

Wyman & Sons, Printers.

SKETCHES OF PROPOSED COVERED WAY FOR SIR HENRY COLE.



BISHOP ZOBEL'S PILLAR, WURZBURG.

BISHOP ZOBEL'S PILLAR, WURZBURG.

THE memorial pillar of Bishop Zobel, represented by one of our illustrations, was set up shortly after the year 1558, to commemorate one of those terrible acts of violence which disgraced Germany during the sixteenth century. The circumstances may be thus briefly related:—

Bishop Melchior von Zobel had entered into a dispute with a knight named Grumbach concerning the possession of certain lands, the Bishop maintaining that they were the property of the diocese, and Grumbach as obstinately maintaining that they formed a portion of his paternal estate. Grumbach took possession of the lands, in punishment for which act (Grumbach was a vassal of the bishop's) the Bishop seized Grumbach's house in Wurzburg (this house still exists, and has a very picturesque chapel, which we may one day illustrate). The latter, in a fit of rage, joined Albert Alcibiades, of Brandenburg, who was at that time making war against the Prince Bishop of Wurzburg. They took Wurzburg, and Grumbach forced the Bishop to pay down a large sum of money. The Emperor, however, interfered, and insisted upon the money being immediately refunded. Grumbach then retired to his castle at Rimpar, and thence joined in various expeditions, which had for their object revenge, and most atrocious cruelties were perpetrated by him and his myrmidons, so much so that the Bishop publicly denounced him, and he was laid under the ban of the Empire. This so enraged Grumbach that he determined to murder the Bishop. He disguised himself, and as the Bishop was going in procession from the palace to the cathedral, Grumbach shot him upon the spot marked by this pillar. A second similar pillar marks the place where the last sacraments were administered; and a third, now within the castle, but before the enlargement of the building, under Vauban Petrini and B. Newman, just without the principal gate, marks the spot where the Bishop expired. For some years Grumbach succeeded in escaping justice for his crime, and was protected by Albert Alcibiades, but he was ultimately captured by the Emperor and put to death; his castle of Rimpar, which still exists, was handed over to the diocese of Wurzburg. The columns were erected by the great Bishop of Wurzburg, Julius Hector von Meapelbrun, who succeeded to the see and principality in 1573. The one we give is built of red sandstone, with an inscribed tablet of bronze.

PHYSICAL SCIENCE IN RELATION TO ARCHITECTURE.

ARCHITECTURAL ASSOCIATION.

AT the ordinary meeting of this association, held on the 17th inst., Mr. Gilbert R. Redgrave, vice-president, in the chair, the following paper on this subject was read by Mr. J. Slater, B.A.:—

Nearly two thousand years ago, a Roman writer whose name is probably familiar enough to you all, but an acquaintance with whose works is, I think, becoming more and more rare among architectural students, wrote a treatise on architecture, and I venture to think it would be to our advantage occasionally to look into his pages and take to heart some of his maxims; for, antiquated as much of the work in question is, there is hardly a chapter from which a few useful hints may not be obtained. I allude, of course, to Vitruvius, who gives the following description of what an architect's attainments ought to be. "An architect," he says, "should be ingenious and apt in the acquisition of knowledge, a good writer, a skilful draughtsman, versed in geometry and optics, expert at figures, acquainted with history, informed on the principles of natural and moral philosophy, somewhat of a musician, not ignorant of the sciences

both of law and of physic, nor of the motions, laws, and relations to each other of the heavenly bodies," and then he goes on to explain at length in what ways so wide a knowledge will be useful to the architect. Several centuries later, in a quarter of the globe far distant from where Vitruvius wrote, the author of an old Hindoo treatise on architecture quoted by Ram Raz in his essay on that subject, lays down as one of the principal qualifications of an architect that he should be "conversant in all the sciences." Thus, you see that both these writers give even greater weight to the scientific than to the artistic side of the profession. Science then was, of course, a very different matter from what it is now, and such a definition as I have quoted of an architect's qualifications would now, almost universally, be deemed too encyclopædic. It appears to me that the present century has seen the reaction against what was till quite recently looked upon as the prosaic side of the profession; the pendulum has swung to the artistic side, and, to a large extent, with very good results. I would at this early stage guard myself against being misunderstood in anything that I may have to say as being in the slightest degree derogatory to the highest and noblest side of our profession,—the artistic. We must all be artists, and have an appreciation for all that is beautiful in art, or our architecture would be but dry bones, without any spirit at all in it; but there is a danger, and a very real one, of architecture degenerating into mere draughtsmanship, and I believe it is because the general pubic have seen and noticed this tendency,—we can never see ourselves quite as others see us,—that there has resulted the general want of appreciation of our labours as professional men, which has so frequently been remarked upon and deplored. Now the great and prominent feature of the latter part of this nineteenth century is the enormous advance made by science, and particularly physical science, amounting almost to a revolution. We, as architects, must keep *au courant* with the times. Now, less than ever, can the scientific side of our profession be ignored. That however highly, and with however much enthusiasm we may cultivate art, we shall still find science of the greatest assistance, I have ventured to read this paper, the object of which will be,—and I must be pardoned if many of the facts which I shall bring before you are of the most commonplace trite description,—to show in how many ways, and how intimately, architecture is allied with physical science. What is physical science? It is simply a knowledge of nature and nature's laws, and I shall ask you to look at the various branches of science somewhat in detail, in order to see how these laws act and how they affect us in our work.

First as to *Geology*. It is a mere truism to assert that the question of the foundations of any building is the most important that one can have to decide, for if there be anything wrong here, the results may be most serious. Nothing can be simpler than the general theoretical rules as to depth and width of concrete required for the walls of a building, and yet there are few things in practice that require so much thought and cause so much anxiety to the architect as deciding, in any particular case, whether the excavations have been taken down deep enough. It frequently happens that a beautifully sound bottom may have been reached in one place, and that deeper excavation accidentally made close by may disclose the fact that the good bottom was really no bottom at all, but merely a thin layer resting on soft and bad ground. Again, in rocky districts "faults" frequently occur, which may cause infinite trouble to the architect if not discovered in time. I have a case in my memory now when I was superintending the erection of a building in the neighbourhood of Tunbridge Wells, where all the foundations rested apparently on the solid rock, but in one place where, from some cause, suspicion was aroused that the rock was not quite solid, a slight excavation showed that a thin vein of soft clay ran for some distance right through the rock, separating it like a seam. Now, in many cases of this kind, a very slight knowledge of geology, or of what Professor Huxley has called "physiography," would be of the greatest possible service to the architect. A walk in the immediate neighbourhood of the proposed site of a building, with a careful observation of the lie of the ground, of the inclination of the strata where they may be exposed by a cutting, or watercourse, the direction of the watercourses, the nature of the soil, and various other natural features, would supply indications to the mind of an elementary geologist which might induce him to have an examination made of a portion of the site upon which he proposed to build, the result of which would frequently lead to the abandonment of the exact spot fixed upon, and to a great saving of subsequent expense to the client. Where buildings are erected on the side of a hill, the security of the foundation and the likelihood of a landslip occurring, depend entirely upon the inclination of the strata. If the slope is inward, buildings may be erected with perfect safety; if outwards, very careful and often costly precautions will have to be taken. A slight knowledge of geology would also frequently enable an architect to judge whether there was any risk of percolation of water on to the site, or of pollution from neighbouring sources of the water supply, if one has to be obtained. One very frequent cause of injury to buildings that have been erected for some time, arises from construction of deep drains near them, or from the erection of buildings whose foundations are carried down much lower, and a knowledge of the nature of soils, would often prevent this, as the geologist would be aware that certain soils which support weight excellently so long as they hold water, crack and shrink invariably if they are drained. I believe I am correct in stating that if a case of this kind occurs when the only cause of settlement is from the shrinkage of the soil on which a building is erected through the tapping of the subterranean water, no legal remedy can be obtained. Do not suppose that I am advocating that we should all emulate the attainments of a Sir Charles Lyell, or anything of that sort: such knowledge as I have been speaking of could be attained by any one through the careful perusal of a good handbook combined with,—and this is the most important thing,—practical observation of any broken district conveniently at hand.

Allied to geology, and coming within the scope of physiography, is *Meteorology*. This, the youngest of the sciences, is still a subject of great interest to all concerned in building, and one that we ought all to know something about. The facilities for travel are now so great, that an architect is almost certain, sooner or later, to be called upon to superintend works in very different parts of England, and even on the Continent, and thence an acquaintance with the climatic conditions of the various districts is very desirable. The quantity of rainfall, the amount of snow in winter, the heat of summer, the direction of the prevalent winds, are all elements which have to be considered in the erection of a private house or public institution, and must modify their construction, and unless attention is paid to these points, failure is likely to occur. Moreover, it is by no means unusual for an English architect to be asked to design a building for one of our colonies or India, and in such a case a correct appreciation of the climatic conditions is even more important; for roofs such as we are in the habit of constructing here would be of little avail against tropical rainfall, tropical heat, or tropical winds.

One of the most important branches of physical science to an architect, and one that unfortunately is not always sufficiently recognised, is that of *Chemistry*. We have, over and over again, to form an opinion on the hardness of bricks and their resistance to weather; on the nature of building-stones and their power to resist crushing and absorption of water; on the excellence of a sample of lime or cement; and on the suitability for decorative purposes of various colours and pigments: in every one of these cases a slight knowledge of chemistry will be found of great assistance. A brick is not an ultimate fact of nature, but is a combination of alumina, silica, and water; its properties as a building material depend upon those of the various constituents of which it is composed, and its hardness and weather-resisting powers depend upon the manner in which the clay or clays have been tempered, mixed together, dried, and burned, and a slight knowledge of chemical analysis would frequently enable us to give a better opinion upon a specimen before us than any of the ordinary methods of observation could afford. Take the more important case of the building-stones: we are, all of us, I suppose, constantly receiving circulars and specimens from owners or agents of stone quarries, giving, with a flourish of superlative epithets, the chemical analysis of the stone in question, set out in large figures. How many of us,—I will not say are able to try for ourselves a simple test or two, but,—have any intelligent idea of what is the real meaning of the chemical analysis given, and what it "connotes," as the logicians say? For us here in London the most important qualities of building stones are their non-absorption of water, and their resistance to the chemical action of the London smoky atmosphere; and I often think as I walk through some of our suburbs and look at the once magnificent, but now rapidly decaying, stone ornaments of the pretentious villas with which we are overwhelmed,—how much we should have been spared had the builders of those edifices possessed but a slight acquaintance with the qualities a stone ought to possess if it is to last here. The question of preserving building-stones from the effect of the terrible London atmosphere is one that has attracted much attention of late years; but it can scarcely yet be said to be satisfactorily settled. I need hardly point out, however, that it is mainly a chemical one. The causes leading to the decay of stone are twofold,—first chemical, and then mechanical. The chemical action of the atmosphere produces a change in the cementitious particles which bind together the silicious grains of a sandstone, and in the entire matter of a limestone, the constituents of which, according to its composition, undergo oxidation or hydration. Where mineral salts occur, new combinations are set up, through the action of the sulphur acids contained in the atmosphere, and in the cases where organic matter exists, this gives rise to nitration. Then, after this chemical action, the stone absorbs more water, and whenever frost occurs mechanical disintegration ensues. If the chemical action can be prevented, all will be well; but, in order to prevent this, we must know accurately the chemical analysis of the stone, and it is just as absurd to think that any one solution applied externally will act as a preservative for all stones, as to think that similar remedies are suitable for all constitutions. It is from this fact having been lost sight of that we have so many diverse opinions as to the value of many of the patented solutions for preventing decay in stone. Even more important is chemical knowledge when dealing with limes and cements. The change that occurs when lime is made into mortar, or when it is calcined, ground, and made into cement, is purely a chemical one, and nearly every different limestone has different combining properties, so that no general rule can be laid down as to the proportions in which lime or cement should be mixed with sand for any particular work; in fact, the whole subject is one that would well repay scientific attention on the part of architects, who, after all, are the people most interested in acquiring an exact knowledge of the subject and with the greatest facilities for studying it without too great an expenditure of time. It would be a very simple matter to take a sample of lime and mix it carefully with various quantities of sand, and test the qualities of the resulting mortar; and if the results obtained are carefully tabulated, after a few years a list of experiments would be obtained of the greatest value, not only to the individual, but to the public. I cannot too strongly impress upon you the fact that science is no abstruse study; that the increase of scientific knowledge is brought about simply by careful observation and experiment on the part of individuals; and that the scientific man is he who quietly observes phenomena, collates facts, and who only draws inferences from a large number of facts which he has himself observed. We architects run real risk of becoming stereotyped in our ideas, from the fact that we are so much brought into contact with builders' men, who are, as a rule, about the most conservative class of people I have ever had to deal with. Take this very question I am now dealing with: we specify that for mortar so many parts of lime shall be compounded with so many parts of sand; but how many of us have ever seen the men using any measure at all? They work by the rule of thumb, and as it generally comes all right in the end, there is a great temptation not to trouble ourselves in the matter. But science never advances by the rule of thumb, and if we refuse to acquiesce in it, even in so small a matter as this, we may at some time or other enjoy the gratification of having added a little to the sum of human knowledge. In the case of colours or varnishes, the increased cost of many of the materials used in their manufacture has led to much adulteration, which, however, is frequently carried out so scien-

tifically, that a great deal more than elementary knowledge of chemistry would be required to enable any one to detect it; but at least we ought to know what kind of adulteration should be guarded against. For instance, if we know that baryta is used instead of lead in many cases, that linseed-oil is adulterated by mixing resin-oil with it, and that turpentine is thinned down by resin spirit and spirit of petroleum, we shall know in what direction to prosecute inquiries if we are suspicious. There is one curious and interesting fact in connexion with colours that is not generally known. White paint is, as you are probably aware, made both from lead as a basis, and from zinc, the latter being much the cheaper of the two. Now the best white paint will very soon begin to get black if sulphuretted hydrogen or any noxious gas has access to it, the lead, which is the basis of it, being at once attacked by these gases. Hence such paint in the interior of a house affords a first-rate test of the sanitary condition of the house, and it would be a very good plan to paint the interior of water-closets in order to ascertain if any sewer-gas makes its way into the house there. In connexion with colours, I may notice the new asbestos paint, which is the result of chemical investigation, and which promises to have most important results in preserving our buildings from fire. Another question of very great interest to us in which chemistry is concerned, is that of the cause and prevention of dry rot. No satisfactory conclusion on this has yet been arrived at, and much good would result from a congress of scientific men deliberating upon it. I believe it is a fact that Swedish white timber is more liable to be attacked by dry rot than Riga or Danzig. This points to the conclusion that it is in the properties of the sap that the mischief lies, and I have a very strong opinion that it will be discovered that the cause of the disease is similar to the cause of diseases to which animals are subject, viz., that there are certain germs in the sap of the tree which under certain favourable conditions set up a species of fermentation, which results in the formation of a fungus that we call dry rot. It would be necessary to carry out a series of experiments extending over several years to prove the accuracy of this opinion, so that I can merely throw it out as a suggestion now; but the way in which the disease spreads is precisely analogous to the method by which other diseases are propagated, and points, in my opinion, very markedly to the germ theory.

That branch of physical science which, twenty years ago, used to be dignified with the comprehensive title of natural philosophy, under which were included statics and dynamics, hydrostatics, optics, and acoustics, has so intimate and well-known a bearing upon an architect's work that I hardly need go into any great detail on this part of my subject. It is impossible to design the smallest cottage without being brought face to face with problems as to the breaking-weight of beams, the strain upon timbers, the thrust against walls, the adequacy and proper distribution of points of support, &c., and all these require for their solution a knowledge of the theory and principles of mechanics. It is quite true that so many tables of scantlings for roofs, floors, &c., exist, that in many instances no one need take the trouble to calculate them for himself, but it is quite impossible to publish tables calculated for all the cases that may occur, and the more extended our practice becomes, the more numerous do we find the cases where tables cannot help us, and where, unless we have principles to go upon, we shall be driven to mere guesswork. The intercommunication columns of the architectural papers prove this very clearly, for there is hardly a number issued that does not contain questions from students or young practitioners asking for information on certain points which they are unable to elucidate by means of the tables only. My experience of tables is that they almost invariably err,—and quite rightly,—on the side of excess of strength, so that, as a rule, no harm will be done by following them, unless (and this risk always exists) a clerical or printer's error has crept in. Then, again, we are constantly called upon to specify for pipes to supply water and gas to a building, and for other pipes to carry off drainage and waste water. Strict scientific rules as to the size and inclination of pipes in relation to their carrying capacity apply to all such questions, and yet they frequently appear to be settled at haphazard. Even such an elementary principle as the tendency of water to run downhill rather than up, seems occasionally to be ignored; and I myself once heard of a case in a country town where a *soi-disant* architect had thought it necessary for some distance to lay down an 8-in. diameter pipe in order to supply two 4-in. branches.*

AN ARCHÆOLOGICAL TRAVELLER OF THE SEVENTEENTH CENTURY.

IN the announcement of the forthcoming sale of the second portion of the Sunderland Library (once but known to a few, and now so famous), more than one of our readers will doubtless have noticed the statement that the new catalogue is to commence with "Chardin." Chardin's is a name which is worthy of attention. Sir John Chardin was not only an ardent, and what is more remarkable for the century in which he lived,—a trustworthy traveller, but he was one of the early Fellows of the Royal Society, among the oldest transactions of which, his papers will be found. He was the intimate friend of John Evelyn, in whose delightful "Diary" will be found more than one notice of the French Huguenot traveller who, driven from his native country, found on our shores the welcome denied him at home. In one of these notices Evelyn refers not only to Sir John Chardin's visit to the ruins of Persepolis, but to Nineveh. Archæologically, Chardin's testimony is most interesting as being perhaps the earliest notice by a modern traveller of the existence of the buried treasures, the discovery of which was to give such a fame to Botta and to Layard, and reveal to us such a store of unsuspected information on the history and art of the distant past.

The extract is from Evelyn's "Diary," under date 1680, the year of Chardin's arrival in London:—"August 30 (1680), I went to visit a French gentleman, one Monsieur Chardine, who, having been thrice in the East Indies, Persia, and other remote countries, came hither in our return ships from those parts, and it being reported that he was a very curious and knowing man, I was desired by the R[oyal] Society to salute him in their name, and to invite him to honour them with his company. Sir J. Hoskins and Sir Christopher Wren accompanied me. We found him at his lodgings, in his Eastern habit, a very handsome person, extremely affable, a modest, well-bred man, not inclined to talk wonders. He spoke Latin, and understood Greek, Arabic, and Persian, from eleven years' travels in those parts, whither he went in search of jewels, and was become very rich. He seemed about thirty-six years of age.† After the usual civilities, we asked some account of the extraordinary things he must have seen in travelling over land to those places where few if any northern Europeans used to go, as the Black and Caspian Sea, Mingrelia, Bagdat, Nineveh, Persepolis, &c. He told us that the things most worthy of our sight would be the draughts he had caused to be made of some noble ruins, &c.; for that, besides his own little talent that way, he had carried two good painters with him, to draw landscapes, measure and design the remains of the palace which Alexander burnt in his frolic at Persepolis, with divers temples, columns, relievos, and statues yet extant, which he affirmed to be sculpture far exceeding anything he had observed either at Rome, in Greece, or in any other part of the world where magnificence was in estimation. He said there was an inscription in letters not intelligible, though entire. He was sorry he could not gratify the curiosity of the Society at present, his things not yet being out of the ship, but would wait on them with them on his return from Paris, whither he was going the next day, but with intention to return suddenly, and stay longer here, the persecution in France not suffering Protestants,—and he was one,—to be quiet. He told us that Nineveh was a vast city, now all buried in her ruins, the inhabitants building on the subterranean vaults, which were, as appeared, the first stories of the old city; that there were frequently found huge vases of fine earth, columns, and other antiquities; that the straw which the Egyptians required of the Israelites was not to burn or cover the rows of bricks as we use, but being chopped small, to mingle with the clay, which, being dried in the sun (for they bake not in the furnace), would else cleave asunder; that in Persia, &c.; he spoke also of Japan and China, and of the many great errors of our late geographers, as we suggested matter for discourse. We then took our leaves."*

Sir John Chardin, it will be seen, was a traveller out of the common. Born in 1643, the son of a Protestant jeweller, who lived in that classic corner of Paris (the island which once formed Lutetia, and on which is built Notre Dame), the Place Dauphine,—the Quai des Orfèvres is still occupied by goldsmiths,—Sir John Chardin early travelled in the East in pursuit of his father's business. The intolerant Louis XIV. and the repeal of the Edict of Nantes kept Chardin from his native country, and drove him to our shores, where he was received with open arms, ten days after arriving being knighted by Charles II., and appointed to the lucrative post of court jeweller; but to the scientific and literary students who formed in its early years the Royal Society, the distinguished traveller was particularly welcome, and he was, as we see by Evelyn's "Diary," almost immediately elected a Fellow. There is little more to be told of the traveller's busy life; he published, in 1686, an account in English of his journey to Persia, followed at later intervals by other volumes of his travels which will be found in most libraries, having been often re-published in various forms. For many years he was agent of the East India Company at the Hague and Amsterdam, the same admirable company of which he speaks so warmly in the preface to his Travels in Persia.†

During his latter years, Chardin resided at the then retired and completely isolated London suburb of Turnham Green, where, in 1713, he died, the Chiswick registers noting his death and burial. Visitors to Westminster Abbey will, however, recall the tablet, with its characteristic motto, to the memory of Chardin,—"Sir John Chardin. *Nomen sibi fecit eundo.*" The *Encyclopædia Britannica* declares that Chardin was buried in the Abbey; but what about the Chiswick registers? ‡

NOTES FROM THE WEST.

SEVERAL important new buildings have been recently completed in the West of England, and a number of others are already in progress or under consideration.

The new grammar school at Crewkerne has just been opened. The school was founded as long ago as 1499 by John de Combe, a precentor of Exeter Cathedral, who endowed it with houses and lands. It has an income of about 700*l.* annually. The new building has been talked about for years, and designs were furnished by Messrs. Giles & Gough, of 28, Craven-street, Strand, London, from which Mr. Trevena, of Plymouth, has erected the school which has now been completed. The structure is principally of Crewkerne stone, but Ham-hill stone has been used on the ground level, and for the dressings, mouldings, &c. It is in plain Domestic style of the fifteenth century, and consists of basement, ground, first, and second floors, and a third floor in the centre tower. The large schoolroom is 60 ft. long by 24 ft. wide, and in it memorials to the founder and to the late head master (Rev. Dr. Penny) will be fixed. The first and second floors contain dormitories and especial provision

* To be continued.

† Evelyn's guess was very correct; Chardin was born in 1643.

* Further references to Sir John Chardin will be found noticed in Evelyn's "Diary," under the dates Dec. 27, 1683; Feb. 23, 1684,—this latter mentioning Chardin's "History of that wonderful Persian monument near Persepolis, and other rare antiquities which he had caused to be drawn from the originals"; —July 18, 1686; May 2, 1687; Oct. 6, 1688; Evelyn, "Godfather to Sir John Chardin's son," the Earl of Bath and the Countess of Carlisle the other sponsors.

† Chardin, referring to the English trade at Smyrna, speaks of it (1686) as "driven by a Royal Company, which is governed after a most prudent manner, and therefore cannot fail of success. It has stood almost three hundred years." He speaks of it as doing business to above half a million annually. It is worthy of remark, in connexion with Chardin's mention of Nineveh, that it was one of the East India Company's servants, Mr. Rich, who may be said to have been the first to make careful excavations at Nineveh. The earliest plans of Nineveh were also prepared by another servant of the East India Company, Capt. Felix Jones.

‡ With reference to the Sunderland Library we may quote once more our old friend Evelyn, under date April, 1699:—"Lord Spencer purchased an incomparable library . . . . wherein, among other rare books, were several that were printed at the first invention of that wonderful art, as particularly 'Tully's Offices,' &c. There was a Homer and a Suidas in a very good Greek character and good paper, almost as ancient. This gentleman is a very fine scholar, whom from a child I have known." This was the origin of the famous Blenheim Library. Among Evelyn's "Correspondence" will also be found a letter to "My Lord Spencer," referring to the recently-purchased library, which, "by the catalogue I have seen, must needs be a very chosen collection." This letter, however, bears the date 1693. Althorp is described in the "Diary," August, 1688.

for any cases of sickness, which can be shut off from the rest of the building. Hot and cold water is supplied to all parts of the premises, and an underground reservoir has been constructed to hold 12,000 gallons of rain-water for laundry and other purposes. Provision has been made for heating with hot water, but all the rooms are supplied with open fireplaces. The walls internally have been plastered, and pitch-pine is used for the woodwork. A house for the master adjoins the school. The new building is situated on an elevated site, and capital views can be obtained from it of the surrounding country.

The promoters of the Taunton street-tramway have, it is said, resolved to abandon their undertaking, not being satisfied with conditions imposed on them by the town council.

A great deal of discussion has taken place in various parts of Wales as to the proposed University College. A commission from Cardiff visited the new and only partially completed Bristol University College to obtain information on the subject, and have since decided to raise a fund of 50,000*l.* towards a new building in their own locality.

The annual general meeting of the members of South Wales Institute of Engineers was held a week or two ago at Cardiff under the presidency of Mr. MacMurtrie. A rather suggestive fact was that no less than three out of the five papers read at the meeting dealt with electricity, the connexion between atmospheric electricity and colliery explosions, and the application of electric lighting to mines, being amongst the subjects considered. The members afterwards dined together.

Shortwood Chapel, Stroud, which has been rebuilt on a more convenient site, has recently been opened.

A new bank has been opened at Cheltenham. It was built by Messrs. Collins & Co., of Tewkesbury, from the designs of Mr. Knight, of Cheltenham, for the Worcestershire Banking Company.

A handsome reredos has been presented to Winchcombe Parish Church. It was designed by Mr. J. D. Wyatt, of London, and executed by Mr. T. Collins, of Tewkesbury.

A pastoral letter of the Bishop of Gloucester and Bristol shows that the Diocesan Association has contributed 645*l.* towards the restoration of sixteen churches; the total cost of the work is estimated at 15,730*l.* The sum of 4,493*l.* is being expended on seven schools, and 7,150*l.* in the improvement of seven glebe houses. To each of these objects the Association had also contributed.

The Penarth Dock Extension is being vigorously proceeded with. A large number of men are engaged in cutting away a portion of Penarth-hill so as to increase the dock area. The work will probably occupy about two years.

The new pier at Newton Noyse, Milford Haven, which has been for some time in process of construction, has been completed, and formally opened. The pier is 700 ft. long, is of iron, and the largest steamers can land passengers at it at any time of the tide. The pier is connected with the railway.

Twenty tenders were received for the building of the new Infirmary at Cardiff; and that of Messrs. Clark & Burton, of Cardiff, for 22,978*l.*, was accepted. The building is to be completed in twenty months.

For some years a temporary wooden building has been used as a mission-room in Newfoundland-road, the centre of a populous district and one of the poorest parts of Bristol. An effort has been made to procure the erection of a permanent church and schools, and the latter have just been commenced. The building will consist of a large room, 70 ft. by 30 ft., to be used for Sunday-schools, lectures, temperance and other meetings, as well as for religious services, class-rooms, soup-kitchen, and working men's club-room. The cost will amount to 1,800*l.*, of which the building contract is for 1,517*l.*

Stains for Wood.—The Adelaide Gold Medal has been awarded to Mr. Stephens for superior excellence in manufacture of stains for wood. This makes the eleventh highest international award received by Mr. Stephens for his stains. The quality of his manufactures is sufficiently attested, and too long known to our readers, to need commenting upon in these columns.

THE SANITARY ASSURANCE ASSOCIATION.

THE first annual meeting of this Association was held at the Offices, Argyll-place, Regent-street, on Wednesday last. Professor Hayter Lewis, Vice-President of the Institute of British Architects, presided.

The secretary, Mr. Joseph Hadley, read the annual report, from which it appeared that the Association commenced the inspection of houses, supervision of sanitary work, and issue of plans and certificates as to the sanitary condition of houses in April last year, and that the houses inspected have varied in rateable value from 36*l.* to 750*l.* The work of the year had involved an expenditure of 365*l.*, including outstanding liabilities, and the balance in hand at the close of 1881 was 2*l.* 6*s.* 11*d.*

Professor Hayter Lewis, in proposing the adoption of the report and balance-sheet, referred to the great public importance of the work the Association had initiated in the metropolis. Other associations had been previously formed in the provinces, and recently one or two similar organisations had been set on foot in London, and it was to be hoped that the community generally would take advantage of the opportunities thus afforded them of obtaining skilled advice as to the sanitary conditions under which they lived. There was, however, a great deal of work to be done before the public would fully appreciate the necessity for sanitary inspections.

Mr. H. Rutherfurd, in seconding the adoption of the report, said that the extension of the business of the Association would depend on the growth in the public mind of the necessity for such sanitary arrangements, and every house dealt with would be a centre for extending the undoubted benefits of sanitary inspection.

Professor de Chaumont, F.R.S., of the Army Medical School, Netley, spoke encouragingly of the work of the Association. He thought the result of their first year's operations was such as to augur well for its future.

Mr. T. Roger Smith, Professor of Architecture, also spoke to the report, and said that, sooner or later, the Association must become a great influence for good. He himself could testify to the thoroughness with which the officers of the Association (Professor Corfield and Mr. Mark H. Judge) did their work.

The report and balance-sheet were then unanimously passed, as was also a resolution requesting the members generally to aid in making more widely known the objects of the Association.

The retiring members of the council were re-elected, and Mr. R. G. M. Creasey was appointed auditor.

THE FALL OF A STAGING IN OXFORD-STREET.

ON Tuesday Dr. Danford Thomas held an adjourned inquest at Middlesex Hospital on the body of George Carter, nineteen years old, a carpenter, who resided at Manorville-road, St. John's-road, Upper Holloway. The deceased was working on Friday, the 10th inst., beneath a staging erected at the corner of Thomas and Oxford streets, when the staging, upon which were bricks weighing eight tons, according to one witness, and fifteen according to another, gave way. The deceased was buried under the bricks, and when extricated, was found to be dead.

Mr. James Edmeston deposed that two of the timbers of the staging were broken, and they were defective in quality. He estimated that 7,000 bricks, weighing 15 tons, were deposited on the staging. The accident resulted from an error of judgment in overloading the staging. The defective, weak quality of the timber could not have been readily perceived.

Mr. Poncione, solicitor, who appeared for the relatives of the deceased, stated that Mr. Hollis, the building owner, had satisfactorily compensated them.

The Coroner: Thus virtually admitting there was an error of judgment.

The jury returned the following verdict:—"That deceased was killed by the falling of the scaffold, on account of its being too heavily laden with bricks, and the timber thereof being in parts defective. The jurors had further to express their regret that the foreman of works had not stopped the loading of the stage with bricks when he first found it bulging beneath their weight; and also that Messrs. Hollis, not being builders, should have carried out building operations under superintendence of a foreman of whose competency they were unable to judge."

Touching this matter, Mr. Riddell (the foreman) writes that he has had the bricks which were on the stage counted, and he wishes us to say that there were 3,814, instead of 7,000, as estimated by Mr. Edmeston.

COMPETITIONS.

New Wesleyan Chapel and Minister's Residence at Clevedon, Somerset.—Designs in competition have been submitted to the committee for the erection of a new chapel and minister's residence. Those under motto "Nota Bene" have been accepted; the author of the accepted designs being Mr. Herbert J. Jones, architect, Wellington Chambers, Bridge-street, Bristol. The other competitors were Mr. R. Curwen, of London, and Mr. A. Lander, of Barnstaple.

Gas Offices, Cheltenham.—The Directors of the Cheltenham Gas Company, at a late meeting, unanimously accepted the designs submitted by Mr. Alfred Smith, Mitcheldean, Gloucestershire, for their new central offices, with residence, to be erected in North-street, Cheltenham (which has recently been widened and very greatly improved by the corporation), and have commissioned the architect to secure tenders for the erection of the buildings forthwith.

Yardley Cemetery.—The Yardley Burial Board, having purchased land lying between Yardley and Acock's-green, near Birmingham, purpose forming a cemetery for the united district, and have adopted the designs of Mr. Alfred Smith, architect, Mitcheldean, Gloucestershire, for the chapel, lodge, entrance-gates, boundary walls, and laying-out and planting grounds. Tenders will be invited at once for executing the various works under the superintendence of the architect.

WIND PRESSURE.

AT a meeting of the Meteorological Society, held on Wednesday, the 15th inst., at the Institution of Civil Engineers, 25, Great George-street, Mr. J. K. Laughton, M.A., president, in the chair, a paper was read "On the Distribution of Pressure upon Flat Surfaces perpendicularly exposed to the Wind." By C. E. Burton, B.A., and R. H. Curtis, F.M.S. In the present state of aëro-dynamics it seems to be impossible to make an *à priori* investigation of the distribution of pressure on a surface exposed to the impact of fluid in motion without introducing such limitations as render the solution arrived at widely divergent from the results obtained by the experiments hitherto made. The authors therefore proposed to themselves to attack the problem from the experimental side only, by a method which, as far as they know, has not been applied in the case of air, viz., the application of Pilot's tube, suitably modified in form, to the simultaneous measurement of the pressures at the centre and at any ex-centrically situated point of a pressure-plate of known dimensions. The results of the preliminary experiments are given in the present paper.

ROYAL NAVAL ENGINEERS.

AN effort is being made, and not before it was called for, to lessen the disabilities and grievances of the engineer officers of the navy. For years, successive Boards of Admiralty have promised that these grievances should be ameliorated. During the debate on the Navy Estimates last year, several members of Parliament urged upon the Committee the necessity of listening to the representations of these officers, and of granting their just and moderate requests. The Junior Lord and the Secretary of the Admiralty stated in reply that much had been done of late years for the engineer officers, and so endeavoured to stave off the impending demand on the Treasury as well as on the Admiralty. But a statement now published shows the incorrectness of this assertion, and that the engineer officers were really worse off in 1881 than they were in 1863, a statement which the Admiralty have not been able to refute. It is to be hoped their case will be taken in hand. Something, too, should be done to improve the position of the engine-room artificers and the stokers.

CORK SCHOOL OF MUSIC.

So much is now being written and thought about musical education in this country, thanks, in a great degree, to efforts of members of the Royal Family, that many of our readers will be glad to hear that successful work is being done at the Cork School of Music. The third report, published last year, showed that the total number of students attending the school was 175, as compared with 192 during the previous session, but this trifling falling-off in numbers has not in any way interfered with the prosperity of the school, as is proved by the fact that in 1879-80, the sum received in class-fees was 487*l.* 6s. 10d., while in 1880-81 it amounted to 565*l.* 6s. 9d., showing an increase of 77*l.* 19s. 11d., which is entirely due to the students having attended more regularly, and undertaken a larger amount of work. The committee rightly point out that the earlier children obtain a knowledge of musical science the better, more especially boys, as they find it very difficult in maturer years to give the necessary time to master what could easily have been acquired in childhood.

THE LATE MR. FRANCIS RUDDLE.

WE have to record the death of Mr. Francis Ruddle, of Peterborough, which took place on the 9th inst. The position which he occupied as a builder, but more especially as a carpenter and joiner, is worthy of notice. He was all his life employed in church and cathedral work in various parts of England, and he likewise excelled in the fitting up of high-class mansions.

His first work of importance dates about the year 1822, when he devised and executed a scheme for preventing, by the introduction of a large horizontal truss of oak, which still forms part of the structure, the further progress of a serious settlement which had occurred in the front of the cathedral at Peterborough, and which threatened its destruction. His father and he, about this time, re-roofed the building. The refitting of the choir of the cathedral, in 1828 to 1830, under the auspices of Dean Monk (afterwards Bishop of Gloucester) first brought him into public notice and into business connexion with Mr. Blore, who, during his long practice, constantly employed him. Sir G. G. Scott was one of the many other architects under whom he was engaged, and who had a high regard for him.

Among the more important of his works were the choir of Westminster Abbey; the Queen's private chapel at Windsor Castle, for which work Mr. Ruddle was complimented by the late Prince Consort; the fittings of the British Embassy at Constantinople; of one of the sultan's palaces, and of the house of the grand vizier; St. George's Church, Doncaster; Ripon and Hereford cathedrals; Wellington College chapel; Kilham Hall, Nottinghamshire; Trinity Church, Coventry; Canford Manor House, Dorset; Latimer's House, Bucks; Battlesden House, Beds; and Battle Abbey, Sussex.

It may be worth recording that when Mr. Ruddle undertook his first work of church restoration, the art of Gothic carving had been long dead. He procured casts of old work, and taught his workmen from these examples.

He was born at Peterborough in 1798, and was, therefore, in his eighty-fourth year. He retained his faculties almost to the last, advising in matters of business until nearly the close of last year.

Many of his former workmen were trained solely by him, and remained during their lives in his employ, some for upwards of fifty years. He will be long and deservedly remembered as an example of thoroughness in work. Sir G. G. Scott wrote of him that "he was one of the best builders, especially one of the very best carpenters and joiners, in England."

For very many years he worked in conjunction with Mr. Thompson, the present Mayor of Peterborough, who now carries on the business.

His funeral was attended by his three sons, two of his grandsons, Mr. Thompson, and about 120 of the *employés*.

Birmingham Architectural Association. An ordinary meeting was held on Tuesday evening, the 14th inst., at the rooms of the Association, Queen's College. After the business, a paper was read by Mr. T. W. Camm on the "Study of Decoration."

INDUSTRIAL AND SANITARY EXHIBITION AT SUNDERLAND.

ON Saturday last the Mayor of Sunderland (Mr. Wm. Wilson) formally opened, in the presence of a large assemblage, an exhibition of industrial, domestic, scientific, and sanitary appliances, promoted chiefly through the instrumentality of Mr. Councillor Rudland, as the result of a visit paid by that gentleman to the exhibition at Brighton. The proposal to hold the Sunderland exhibition was warmly encouraged by the local members of Parliament, and a number of gentlemen had been induced to act in the capacity of judges in awarding gold, bronze and silver medals, and certificates, to the successful competitors. The exhibition, which is held in the Skating Rink, Hudson-road, will remain open during the current week, and has already been largely attended. The exhibits are of a very varied and miscellaneous character. Much prominence is given to the subject of domestic lighting, heating, and sanitation, the catalogue being prefaced by a paper on "Domestic Sanitation," by E. Gregson Banner, C.E. In the exhibition are to be found models illustrative of advanced systems of sanitation. In addition to the exhibits of Messrs. Banner, sanitary appliances are shown by "The Antiseptic Apparatus Manufacturing Company"; Mr. A. A. Rickaby, engineer, Monkwearmouth; W. Harriman & Co., Blaydon-on-Tyne; and others. With regard to lighting apparatus, it would seem as though the inventors and manufacturers represented at the exhibition are determined, if possible, to outshine the electric light. The Sunderland Gas Company, for instance, have suspended in the centre of the building a 1,000 candle-burner—F. Siemens's Regenerator Patent,—three 350, and two 250 candle-burners of a like description, and two 200-burners (Bray's patent). Clusters of the Albo-carbon light are also shown by Mr. Geo. Hudson. Several descriptions of gas engines are also on view. The Patent Imperial Window Company, and Mr. R. Adams, patentee of the Anti-accident Reversible and Sliding Window, are also represented. Among the miscellaneous exhibits may be mentioned the artistic wall-papers of Messrs. Wm. Woollams & Co., 110, High-street, near Manchester-square, London. The Art-tile, China, and Glass Painting Company, 81, Finsbury-pavement, and Messrs. Craven, Dunhill, & Co., Ironbridge, Shropshire, show some pleasing specimens of their work. A number of oil-paintings also adorn the walls, but the exhibition is not strong in the artistic element.

BUILDING PATENTS.*

APPLICATIONS FOR LETTERS PATENT.

646. H. H. Lake, London. Composition for the protection of wood, &c., from fire. (Com. by J. Wildi, Suhr, Switzerland, and J. Schambeck, Munich.) Feb. 10, 1882.

647. C. Slagg, Leeds. Preventing the fouling of soil-pipes of water-closets, &c. Feb. 10, 1882.

652. J. Stainer, Heckmondwike. Apparatus for lifting stones, bricks, &c., on to scaffolding. Feb. 10, 1882.

654. T. Fraser, Aberdeen. Linings for vent flues and chimneys. Feb. 10, 1882.

658. A. McLean, London. Slabs or panels for decorative purposes. Feb. 10, 1882.

663. J. F. Williams, Liverpool. Sliding windows. Feb. 11, 1882.

666. H. J. Haddan, Kensington. Treatment of clay for the manufacture of bricks, tiles, &c. (Com. by F. Cancalon, Roanne, France.) Feb. 11, 1882.

681. J. W. Pitt, Loversedge. Hinges for doors. Feb. 11, 1882.

715. R. M. Chevalier, London. Venetian blinds. Feb. 14, 1882.

720. C. D. Abel, London. Ovens. (Com. by W. Loreng, Vienna.) Feb. 14, 1882.

746. T. F. Wintour, London. Ventilating apparatus. Feb. 16, 1882.

755. R. Weaver, London. Water-closets. Feb. 16, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named.

Feb. 14, 1882.

4,393. C. Shields, Manchester. Safety-valves for domestic boilers and hot-water apparatus. Oct. 10, 1881.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street.

4,425. T. Stokoe, Headingley. Apparatus for warming rooms, greenhouses, &c. Oct. 11, 1881.

4,565. W. M. Farley & J. H. Bond, Torquay. Apparatus for supplying dwelling-houses with water. Oct. 19, 1881.

5,315. W. Clark, London. Fixing window-glass. (Com. by T. Tanner, Otage, U.S.A.) Dec. 5, 1881.

Feb. 17, 1882.

4,423. W. A. Barlow, London. Slates. (Com. by T. Finger, Coblenz, Germany.) Oct. 11, 1881.

4,557. J. A. Hornby, Menai Bridge. Water-closets. Oct. 19, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending February 18, 1882.

1,031. G. Price, Birmingham. Attaching door or other knobs of handles to their spindles.

On the inside of the neck of the knob is formed a toothed rack. On one side of the spindle is a trough in which is secured a spring, which has a tooth on its free end, which engages in the toothed rack. March 10, 1881. Price 6d.

1,050. W. B. Bryan, Blackburn. Water-closets, &c.

The slop and waste water is intercepted and used for flushing the water-closets. (Protection not allowed.) March 11, 1881. Price 2d.

2,082. H. E. Cooper, London. Syphonic apparatus for flushing.

The siphon is brought into action by the pull of a lever. (Protection not allowed.) May 12, 1881. Price 2d.

2,228. S. & J. V. Day, Glasgow. Harbour and dock works.

The foundations are formed of concrete, which is placed in position in a plastic state in order to preserve the shape of the blocks. (Protection not allowed.) May 21, 1881. Price 2d.

2,845. T. Drake, Huddersfield. Apparatus for heating and boiling water.

In a cylindrical casing are placed coils of pipes which are coiled round two vertical tubes within which are the burners for the gas. June 29, 1881. Price 6d.

MARBLE DECORATION.

A NEW and interesting process of decoration has just been carried out successfully by Messrs. Keith & Co., from designs by Mr. William White, F.S.A., in the reredos of the new Church of St. Michael's, Battersea. The panels are of white marble inlaid with colours of permanent enamel paint. The pattern is laid on the marble, either transferred from the drawing, or painted in by the artist's own hand. Some ingenious manipulations then leave the painted parts of the marble forming the design to be bitten away to a clean delicate outline. The parts thus incised are then filled up with the enamel, or, as in the present case, merely painted in, by which means the soft richness of the relieved surface is obtained, in addition to the colour. In these panels the body ground of the figures is left in white marble, the lining out of the features and draperies being in various suitable colours. It will be seen from this description that genuine character or great fidelity to an original may be obtained in a most durable manner. Messrs. Keith have produced from the architect's drawing at a small cost (35*l.*) figure subjects, with a diaper background on three panels. On either side of a large central cross are St. Mary and St. Joseph of Arimathea, St. John and St. Mary Magdalene, and two angels, rose and lily and other flowers. On a somewhat small scale, and with insufficient surroundings, much of the effect is lost from a distance. But it will bear close inspection, and the invention will prove valuable.

CUSTOM HOUSE AND WOOL QUAY.

RIVERSIDE improvements are being constantly made, and we have to note the erection here of a massive wall for the Fishmongers' Company, from designs of their architect, Mr. Thos. Chatfeild Clarke. The structure has been carried out considerably in advance of the old river frontage of the quay, and a large additional area of landing space is thus secured. A feature in the construction, in order to render the work impervious to wet, is the introduction of a perpendicular central damp course, consisting of a course of bricks embedded in asphalte, and perfectly bonded into the wall.

The works have been executed by Messrs. Lucas & Aird, under the superintendence of Mr. Walter B. Mitchell as clerk of works for the Company. The damp course has been laid by Messrs. Turner and Burch (the Granite Rock and Seyssel Asphalte Company).

COMPETITION FOR SCULPTURE.

ST. GEORGE'S HALL, LIVERPOOL.

SIR,—I have not often met with a more perverse misrepresentation of facts than appears in a letter in your last number, signed "Drill," referring to competitive designs for sculptured panels at the above-mentioned building. This is the more inexcusable as, when penning his letter, the writer must have had staring him in the face, on the front page of the *Builder*, the advertisement containing the true state of the case. He says, "artists are invited to compete and to send in twenty-eight designs, half-size, that is to say, from 2 ft. 2 in. to 2 ft. 9 in. square, which would require, to do them roughly, at least six months," and be worth at least 500*l.* or 600*l.*, &c. Now, what are the facts? There are not twenty-eight "designs" required. There are twenty-eight panels, but only seven "designs" wanted, these designs being repeated.* They are not required to be half-size, but only one-quarter. What have to be sent in are seven sketches in outline or monochrome, varying from 1 ft. 1 in. to 1 ft. 6 in. square. For these a first premium of 200*l.*, a second of 100*l.*, and a third of 50*l.*, were offered.

If "Drill" values his talent and skill so highly as 500*l.* or 600*l.* for these, he had better not compete. It is not expected that either Millais or Leighton will come into the arena. He proceeds,—"There is not the slightest guarantee that the successful artist's work shall be carried out; or, if carried out, that he himself shall execute them." There are many artists capable of making a beautiful design who are not sculptors. The fine group in the tympanum of this very building was designed by Professor Cockerell, but certainly not sculptured by him. It was for the purpose of giving an opportunity to artists in general that this arrangement was made. Should the successful design proceed from a sculptor, no doubt he will be employed.

The oddest complaint, however, remains. "Nay," says he, "there is not even the promise that the works premiated shall even remain the property of the artist." I wonder what he supposes the premiums are offered for. If the artist is to pocket the reward and walk away with the designs, what is left to the corporation of the city? They are not gallery-pictures which are wanted, but working drawings, which will be of no value when the work is executed.

The intentions of the committee are honest and fair, and I think liberal. J. A. P.

PUBLIC RECORD OFFICE.

SIR,—My attention having been called to the correspondence now going on between the readers at the Public Record Office, Fetter-lane, and the editors of the principal London newspapers, and especially to a letter which appeared in the *Builder* of February 11th, appealing to her Majesty's Government for some artificial light in the public reading-room of the Record Office on foggy and dark days, will you kindly permit me to say a word or two upon the subject?

I must acknowledge to be somewhat surprised that such a simple matter should be allowed to cause so much ill-feeling, and it is certainly very much to be regretted that for the sake of a few shillings the Record Office authorities appear to be so desirous of increasing the violence of a storm which is surely becoming every day stronger and more dangerous. Every person must feel deeply indebted to the Government for throwing open the public records to the literary student, and I am one of the very last persons that would wish to do anything likely to injure them. In fact, I have been the means upon more than one occasion of rescuing important historical documents from destruction; but it does appear to me to be a very curious fact that for the cost, as your correspondent "Recorder" puts it, of a few yards of pipe and one or two burners, these records are useless to the historian during many days in a year.

Twelve years ago the very same annoyance occurred to me that has occurred to dozens of readers during the past month. I was engaged in transcribing a very important document one morning in that same round fireproof room now so soon likely to be a by-word over the world,—at times the darkest, and certainly the most draughty room ever erected for the public convenience,—when, lo and behold, a dense "pea-soup" fog came over Fetter-lane. Not a light was to be permitted to enable me to continue my transcribing, and after stopping an hour with a view to test the continuance of the fog, I was compelled to quit the building that day for good, and return home, a distance of several miles, and back again the next day to finish my transcript, which I would have completed with a gas-jet above me in half an hour the day before. And yet during the twelve long years since then the Government are still in the same position, and the reader is no better off than I was then.

The argument which has been advanced by the Deputy Keeper,—that the introduction of a light will endanger the records,—is, I must say, a very remarkable one, and it will be interesting to know upon what grounds he bases the opinion. As I can boast of being the historian of the district, I have made every inquiry possible, and have consulted the structural details of the building, and I must say I am met on all sides by the direct opposite opinion to that expressed by the Deputy Keeper. For, as your correspondents very justly say, the gas is already in the building, and the room is called by the officers of the Fire Department fireproof. I am, therefore, bound to tell my troubles of twelve years ago, and add my sincere wishes for the speedy removal of a most vexatious and yet easily adjusted grievance.

Time was when the British Museum Reading-room was in the same position as the Public Record Office Search-room is now. Thanks, however, to the *enlightened* management of Mr. Bond, the respected Librarian,—and I give him, in sincerity, my humble thanks in the above expressive word,—the Museum readers have not now to bundle pell-mell out when darkness sets in, but can pursue their studies with the greatest comfort and convenience. We can recollect the time, only a few years since, when the idea of lighting up the reading-room was enough to make the two last librarians believe that Fenians of the deepest dye wanted to blow up the building. And a few years hence we shall have our laugh over the past vagaries at the Public Record Office, and rightly wonder that for so many years the public were so much inconvenienced, while every other public building in London studied the interests of the public as well as the interests of even those obliging officials of whom I cannot speak in too much praise. T. C. NOBLE.

* This is not suggested in the advertisement.—ED.

ROOF COVERINGS FOR CATTLE SHEDS.

SIR,—In reply to correspondent "Ionomy," I have lately had to consider the same question. The difference in cost between roofs of small span of slate and galvanised iron is so slight that it is not worth considering. Slate is decidedly the best.

For large spans, galvanised iron is cheapest, and costs less for framing and piers. 50 ft. or 60 ft. span can be covered without intermediate columns. No. 18 gauge,—280 lb. to cover a square for a lasting roof. No. 22 gauge,—185 lb. to a square for a cheap roof. For No. 18 gauge, purlins can be 6 ft. to 8 ft. apart.

If the roof should oxidise, paint with anti-corrosion or peroxide of iron paint. Roof stripping must be prevented by louvred openings in the sides, or lanterns, dormers, or other openings.

I do not think exhalation will have much effect. The life of the roof will depend on the quality of the sheets and the coating of spelter or zinc given the sheets. I have a roof of twenty-three gauge (about thirty squares) that has been in existence for twenty-two years, and is a good roof now, but it is coated every four years with Carson's anti-corrosion paint, and I am glad to say that I have never found rust form where this is used.

If cost is no object, use V. M. zinc, Italian corrugation, but in all cases slate is preferable for small spans, as it is suitable for buildings of a permanent character. ROBERT PHILLIPS.

SIR,—I believe a circular girder felt roof, erected on the double bow and string principle, would suit the requirements of "Ionomy."

In the first instance, it is much cheaper and can be erected in shorter time than any other kind of roof. Secondly, if the girders are well secured to the walls, and the felt properly nailed to the boards, it will stand firm in all weathers without any danger of wind stripping.

JOHN ROGERS.*

* Several other letters on the same subject have since reached us.

SPECIFICATIONS.

SIR,—Mr. Ewan Christian's address,—ostensibly to young architects,—may be very well considered, and his advice adopted, by older practitioners. In some of his remarks there is much to interest others also,—notably, their servants, the clerks of works. As one of that ilk, it has been my fortune to meet with various kinds of specifications such as he describes, but I have also had to superintend the carrying out of large and costly public works where the specification was altogether absent, and this too under a F.R.I.B.A., who exactly answers Mr. Christian's description, one "who thinks his art so high that he cannot condescend to things so low, and so gave himself no trouble in the matter!" Of course there have been "heavy bills for extras, and much dissatisfaction," especially on my part, as I have had to ascertain the architect's wishes as well as I could, as we went along,—no easy matter with such a one, who did not know his own mind, involving many alterations. May I never be called upon to serve another of his kind!

A CLERK OF WORKS.

MUNICH GLASS.

SIR,—I read with much interest in your issue of the 4th inst., the notice of the able paper read before the Society of Arts on "Stained Glass"; but having had some experience of Munich glass I cannot in justice let it pass without comment. The whole tone of the reader appears to me to be based on what was rather than on what is. The windows at St. Paul's, and at Glasgow and Cologne cathedrals are the examples so generally referred to, but they were executed between twenty and forty years ago. How do our windows of that period look? They must certainly be pronounced inferior to the Munich ones, and will not bear comparison with the best old specimens, like those the lecturer compared with the new windows at Cologne. Vast strides have, however, been made during these last twenty years in this country; Munich has by no means remained behind, but has made a most marked improvement, especially in the better understanding of glass and its technical treatment. At the present time the successors of the establishment of the venerable defunct King Ludwig, by still possessing men who are in every sense of the word true artists, and at the same time by working on the right principles applicable to glass, produce now windows which will compare favourably with most of our own countrymen's specimens. While admitting all that the speaker says in favour of English stained glass, every one who has taken the trouble to look must say that a Munich window of to-day is no more like one of the period referred to in the lecture than an English window in 1882 is like one of twenty or thirty years ago. ANOTHER F.S.A.

PLUMBERS' WAYS AND THE COST OF PLUMBING.

SIR,—Last week I had something out of the common to do with plumbers, and think that the following should be brought to the notice of your readers.

Four men, two plumbers and two labourers, were engaged to do certain plumbers' work direct under my supervision. I was very particular, so I wished to have first-class London plumbers, as the job had been done before, and was a failure. I received testimonials stating that the plumbers were efficient and to be relied upon. We commenced work, and the following is the style in which these plumbers went about the job. The first thing that they commenced with was the fixing of the 4-in. lead soil-pipes, with the D-trap for the closets. The pipe was straight, and without a bend. It did not require scaffolding, but was what the general foreman calls an easy job. Time fixing 18 ft. of 4-in. lead soil-pipe and two traps for the ground and first floor closets, two plumbers four days each, also two labourers four days each. Plumbers' money and their country money amounted to 3*l.* 8s. The labourers' money and their country money amounted to 2*l.* 6s.; total, 5*l.* 14s. This amount of work should not have cost for labour more than 1*l.* 5s. according to any price list.

But can this be wondered at, when I give you an outline of their style of work, which I have taken with great precision? The fixing of the trap and soil-pipe from first to second floor was done as follows:—The end of the third length of soil-pipe was beaten in to allow it to enter the one fixed. This was done in the shop. It was then taken and put into its place; then taken down, and the end of the pipe blacked over; this was allowed to dry, then the pipe again put into its place, the joint scribed for the distance to solder; taken down again into the shop, where the end of the pipe was shaved, then tinned,—that is, the end was rubbed round with solder, and all wiped off again. This pipe was then again taken up, and again put into its place. This is what these skilled workmen call *offering it up* to mark for the hole wherein the

branch from the trap enters. This done, the pipe was *again taken down* into the shop, and a hole cut for the branch. This was one day's work. Next day the pipe was *again* taken out of the shop to its place, and again *offered up*. The next job was to fix the trap, and to put on 2 ft. of 4 in. pipe for the branch. This was, after twenty-three different times taking out and refixing, finally settled that it would do. Then about 28 lb. of red-hot solder was brought to the scene, and the trap tacked to the branch pipe, and also this branch pipe tacked to the soil-pipe; after which the lot was *again taken* into the shop, and the two joints were made, also some tack soldered on. This completed another day. The next day the trap and pipe were taken to their resting-place without any *offering up*, and finished. I then asked these men whether this was the usual style of doing plumbing work? They told me they never adopted any other method; they had learned their trade in London, and had always given satisfaction.

Now, sir, I think that the plumber should be taught to work to lines like a carpenter or mason: this would save all this lifting up and down, and bring the price of plumbers' work a little nearer the mark. Some plumbers manage to work to a price-list, and why not all? There certainly must be a better mode of work than that which these two plumbers had, and I see no valid reason why some of your able geometricians cannot set to work and write a few lines and give drawings to set the plumber right.

Lately I have read many things about plumbing in different journals, some of which are extremely useful and interesting, but not one has yet shown the plumber how to fix by lines a closet-trap.

W. T., Architect.

DRAPERS *v.* BUILDERS AND DECORATORS.

SIR,—As every week now we see fresh firms of drapers advertising themselves as builders and decorators, it would be as well that the public should know the system on which most of these firms work. Having no plant, and often no person who understands anything of the work whatever, they have to let it to some one who does understand it, and who has plant; of course, taking care not to forget themselves in the transaction. I know of a large job now at the West End that is let to a firm who, in their turn, have sub-let the greater part to another firm, although the first firm have their name painted on the steps in glaring colours, not one pair of which belongs to them, and which, if washed, would probably reveal the name of the firm who are really doing the work; and this letting and sub-letting, I am sorry to say, is more the rule than the exception. This is well known in the trade; but I think if the public knew it, they would be the best judges as to whether this new system of employing drapers, or the old,—that of going direct to the tradesman who does the work,—is the best.

FULL WAGES.

WOOD PAVING.

SIR,—The remarks of Mr. Rawlinson, in your issue of the 4th inst., on the above subject, have this day been reproduced in the *Eastern Daily Press*, and have caused some considerable excitement amongst the ratepayers of this city (Norwich), who are now spending (under the sanction of the Local Government Board) 25,000*l.* in wood-paving.

Will you allow me to ask Mr. Rawlinson, through the medium of your paper, where wood-pavement has been laid by a competent tradesman on sand in London or elsewhere and failed to give satisfaction? I may mention that I have carried out a considerable quantity of this class of work, without concrete, in London and other places, amongst which I may state that I have laid about 50,000 yards super. in this city during the past nine months, and, without endeavouring to take any credit to myself for the way in which the work has been executed, I venture to say that wood-paving laid on a good gravel (or coarse sand) foundation, thoroughly rammed and well grouted, will not only be found to be as pleasant to drive over, but equally (if not more) durable than that laid on concrete. The total cost of the Norwich work per yard does not exceed 7*s.*

JACOB P. BATCH.

SCHOOL BUILDING NEWS.

Sheffield (*Cornwall*).—**A small building for Sunday-school purposes has been erected in the hamlet of Sheffield, in the parish of Paul, Cornwall. The architect is Mr. J. S. Tregenza, and the contract was let to Mr. J. Tregenza, of Mousehole, and Mr. T. E. Wallis, of Sheffield. Much of the work, however, was done without pay. The farmers hauled the stone from the quarries near, the stonemasons worked the granite of which the front is built, whilst the carpenters put on the roof and made the forms. Under these circumstances a room, 36 ft. long, 19 ft. wide and 13 ft. high, has been provided for about 130*l.***

CHURCH-BUILDING NEWS.

Stretton.—On the 19th ult. the interesting Early English church of St. Nicholas, Stretton, Rutlandshire, was re-opened, after being thoroughly restored. The whole of the roofs are new. The early semicircular arcading has been rebuilt, using up all the old stones as far as practicable. The north aisle is enlarged, and the defective masonry throughout the church restored. The quaint old bell-turret was taken down some few years ago (being unsafe to stand). The stones were all carefully marked, and it has been built up again with the original masonry, and the two bells rehung. The best of the old bench-ends and the Stocken Hall pew have been preserved, and used in the transepts. The chancel fittings, with the pulpit, desk, lectern, &c., are of English oak, and of rich design. The carving of these, and the restoration of the pier-caps, &c., have been executed by Mr. Geo. Belton, of Belgrave. Four memorial stained-glass windows, by Messrs. Clayton & Bell, have been inserted (three in the chancel and one in the new window in the north aisle). The church is warmed by one of Porritt's underground stoves. The whole of the works have been carried out by Mr. Thos. C. Halliday, of Greetham, Oakham, under the superintendence of Mr. James Fowler, architect, Louth, Lincolnshire.

Books.

Hopes and Fears for Art: Five Lectures delivered in Birmingham, London, and Nottingham; 1878-1881. By WILLIAM MORRIS. London: Ellis & White. 1882.

THESE lectures on art are pervaded by a great deal of what is intended for, and, in some cases may be called, very eloquent language of appeal and denunciation, characterised often by a lamentable want of practical sense and insight into the real conditions and difficulties of modern life. Mr. Morris is one of those enthusiasts who seem haunted by the idea of bringing back a golden age, and who seem to think that this can be done by wilfully ignoring the present facts of life and society, and by proposing to go back to a former condition of things, when the world was much less crowded, and all things could be done with greater leisure and consideration than is generally possible at present. The social problems of to-day are infinitely more complicated than in the times with which Mr. Morris is in love, and to ignore this fact is absurd. The author is eloquent against the effects of machinery and of the subdivision of labour in deadening the individual interest of the workman in his work, and substituting mechanical for artistic production; and he talks as if this were a wilful crime against the people, which could be removed at the word of command. His political economy is the political economy of Ruskin; in other words, of what, in view of present facts, is an imaginary Utopia. If Mr. Morris could tell us how an enormously overcrowded society is to earn its living and find a market for its labour without the economy in production provided by machinery and subdivision of labour, we should have cause, indeed, to be thankful to him; but, so far from attempting to grapple with this problem, he hardly seems aware of its existence. He is indignant that London should have covered an immense tract of country with houses where there were formerly fields and villages. Unfortunately, human beings, like the lower animals, when congregated together, will increase and multiply. If Mr. Morris could have counteracted this tendency, we might have done without the crowds of houses, no doubt; or, perhaps, he would prefer that the people should live in burrows in the earth, like rabbits. We may remind him, however, that a great man who had no lack of sympathy with the beauties of nature—Dr. Arnold—saw in London "a sublimity beyond that of the sea or the mountains."

For modern scientific progress and study Mr. Morris seems to have the supremest contempt and indifference; but he can no more push them aside than push back the Atlantic with the traditional mop. The fact is that, so far from the present age being a hopeless and degraded one, as he would have us believe, it is an age of very great achievements, and will be regarded in the history of mankind as a very remarkable epoch. But the tendency of the strongest intellect of the day is towards science and not towards art, and no amount of lecturing will alter the fact. It is very probable that the science of this generation is unconsciously laying the basis for the art of a future generation.

We dismiss the political economy side of the matter, therefore, on which it seems useless to argue with a writer who takes this tone, to glance at one or two of the suggestions more directly connected with the art and architecture of the moment. The central position of architecture among the decorative arts the author puts very decisively:—"They are all summed up in one word—architecture; they are all parts of that great whole, and the art of house-building begins it all. If we did not know how to dye or to weave; if we had neither gold, nor silver, nor silk, and no pigments to paint with, but half a dozen ochres and umbers, we might yet frame a worthy art that would lead to everything, if we had but timber, stone, and lime, and a few cutting tools to make these common things not only shelter us from wind and weather, but also express the thoughts and aspirations that stir in us." This is true so far; but the idea, expressed a page or two further on, that the greatest foe to art is luxury, is unsound. A great deal of the finest and richest decorative art of the world has been produced in periods of the greatest luxury, and has been called forth by the desire for luxurious surroundings and appointments.

The lecture entitled "Making the Best of it," contains a good deal of suggestion as to the means of making an ordinary unarchitectural house passable in its exterior and interior aspects. As to the outside, Mr. Morris confesses that there is not much to be done with it, though we can hardly concur in the remark that when a building is ugly in form it will bear no decoration. It is little use, certainly, to bring out its main lines in any marked way,—that is only to emphasise their ugliness; but surface decoration may, at least, give it one sort of beauty. We see this exemplified in many Japanese jars and other objects, the main forms of which are often bad, but which are admired, even by people who profess very fastidious taste, for their fine surface decoration. The suggestions for the treatment of the interior of rooms are nearly all good; and in this branch of art Mr. Morris is an approved master. In speaking, *en passant*, as to the designing of patterns, the author observes that it is clear that a recurring pattern must have a geometrical basis, "only the structure may be more or less masked, and some designers take a great deal of pains to do so." This seems an inadequate expression of the facts. A large proportion of the best surface ornament in existence arises in great measure from the masking or evading of what is in reality a very simple geometrical basis. This is especially the case in the many Saracenic patterns, which are simple enough when reduced to their elements, but have an appearance of great richness and complication owing to the artful management of the lines, so as to evade the expression of the real structure. Mr. Morris thinks this is not necessary or desirable in large and important patterns, and he has, if we remember rightly, illustrated this in some fine specimens of his own designing; but we still think the highest effect is gained when the composition is made to appear continuous. One most important point is emphasised:—"No amount of delicacy is too great in drawing the curves of a pattern; no amount of care in getting the leading lines right from the first can be thrown away, for beauty of detail cannot afterwards cure any shortcoming in this." Mr. Morris puts the reason for preferring comparatively small panes in a window to great plate-glass sashes, in a manner that many will sympathise with. We want a window, he says, to interpose something between us and the outer air, "to make us feel as if we were indoors on a cold day"; besides which, a large, bare window leaves a most awkward gap in the architectural design, where there is any, both of the interior and exterior. We once heard a significant comment on this point, from a practical man, with no theories about art of any kind, who had taken rooms in one of the large, plate-glassed offices which are often built now. "I feel," he said, "as if I were sitting in the street."

Considering that Mr. Morris is prominently connected with the Society for the Protection of Ancient Buildings, we are certainly amused at the *naïveté* of his remark in regard to such buildings and restoration. "These old buildings," he says, "have been altered and added to century after century, often beautifully, always historically; their very value, a great part of it, lay in that." Just so. Each generation added

to them as its own needs and tastes inclined it. But if Mr. Morris's society had existed, and been able to carry out its principles all that time, all these alterations and additions would have been stopped.

The Towers and Steeples designed by Sir Christopher Wren: a Descriptive, Historical, and Critical Essay. By ANDREW T. TAYLOR, Architect. London: Batsford. 1881.

THIS is a sensible and pleasantly-written little book, and the views serve to show the variety that Wren's steeples display, but the sketches are so small and so slight that they can only be regarded as memoranda.

Records of St. Michael's Parish Church, Bishop's Stortford. Edited by J. L. GLASSCOCK, jun. London: Elliot Stock.

MR. GLASSCOCK has done a good work for Bishop's Stortford, and, so far as we can judge, has done it very well. He has not merely printed with care the churchwarden's accounts, inventories, and other parish papers, but has added a number of notes which show antiquarian and general knowledge. We remember one of his name who some years ago was a well-respected builder in Bishop's Stortford. It would be a good thing if Mr. Glasscock's example were followed in many other parishes.

Miscellanea.

English and Foreign Artificers.—According to the *Liverpool Journal of Commerce*, a compliment has been paid to English cabinet-makers in the inquiry opened by the Minister of Arts in France into the working of apprentice-schools. It was stated that in this branch of trade the night-schools established in Paris for geometrical drawings, &c., were mostly attended by German working-men, who in many cases were the sons of master cabinet-makers. Some of the employers complained of the lack of interest shown by French workmen, and in dwelling on the decreased exports in this branch said the tone was now set by English houses, and those of Paris were compelled to imitate the furniture sent over by their most formidable rivals in the Universal Exhibition. The decline in the trade has been so marked that very few apprenticeships are made in Paris, where the majority of those employed, numbering in all 12,000, belonged originally to the provinces. It was averred that out of this number not more than 300 could read a plan. One of the commissioners referred to the artistic work displayed at some of the carriage entrances of the leading residences in the capital. The president of the Syndical Chamber of Master Joiners replied, "At the most twelve workmen out of 12,000 are capable of turning out such *travaux de choix*." The question referred not to carved ornamentation, but simply to the construction of gates, with their complicated panel-work and mouldings. The upholsterers account for the intellectual inactivity apparent amongst their workmen by alleging the subdivision of labour, each having a given class of design to follow, and caring nothing for the various plans for their *ensemble*. Apprentice schools in this branch are urgently demanded. Wood-carvers and stone sculptors are represented as suffering from mental sloth.

Steeple Jack.—The top of the spire of St. Jude's Church, Kensal-green, London, showing signs of falling, Joseph Ball, of Tork Castle, Oldham, was called in, who at once took 4 ft. down from the top of the spire stonework. Below this was brickwork, which had also given way. Mr. Ball started by erecting his large ladders one on the top of the other in a perpendicular line straight to the top of the spire, and then commenced to fix his staging just under the part requiring repair, which saved considerable time and expense of staging from bottom to top, and in a few days completed the work.

Plumbing.—Notwithstanding the exhibition of specimens of handicraft shown at the International Exhibition, each competitor for the prizes offered by the National Health Society will be required personally to exhibit his skill in plumbing at a competitive examination, which will be held on Tuesday, the 28th of February, and Wednesday, the 1st of March, in the Eastern Arcade, Horticultural Gardens, South Kensington. The judges will be Mr. George Shaw, Mr. W. Eassie, Mr. Ernest Turner, and Mr. C. Hudson.

The Patrick Stead Hospital at Halesworth, erected out of the money (27,000*l.*) left for the purpose by Mr. Patrick Stead, a native of the town, is now nearly completed. The architect is Mr. Henry Hall, of Doughty-street, Mecklenburgh-square, whose designs were selected in open competition. The style is Elizabethan. The structure is of red brick, with dressings of Doulton stone. The high-pitched roofs are covered with mottled Broseley ribbed tiles, surmounted by ornamental ridges; and there is a piquant octagonal bell-turret. A striking feature in the main front is some excellent sculpture in basso-relievo in the central gable. This is in stone, half life-size, and represents our Lord healing the sick. This sculpture, as well as the rest of the carved work upon the building, is by Mr. Harry Hems. The floors throughout are of pitch-pine; the stoves are by by Messrs. Barnard, Bishop, & Barnards, of Norwich; the mantelpieces are of pitch-pine, ornamented with painted Scriptural subject tiles. The operation-room is on the first floor. The general contractors were Messrs. Samuel Howard & Son, of London and Halesworth; the lead glazing is by Messrs. Moore, of London; the clerk of works was Mr. A. F. Scott. A view and plans of the building were published in vol. xxxix. of the *Builder*, pp. 531, 532.

Glasgow Archæological Society.—On the 16th inst., at a meeting of this Society, Mr. D. Murray, F.S.A. Scot., read "A Note on Glasgow and other Provincial Coins and Tokens." Mr. W. G. Black, member of the British Archæological Association, read a paper "On the Origin and Theory of Charms," after which there was exhibited an old jug of Prestonpans or Portobello stoneware, with a view of the Broomielaw; also a book entitled "The Former and Present State of Glasgow contrasted, — A Dream: Glasgow, 1787."

The Forest of Dean U.D. School Board have appointed Mr. William Jones, of Cinderford, Gloucestershire, clerk of the works for their new school buildings, now in course of erection at Lydbrook and Cinderford, Gloucestershire, from the designs and under the superintendence of Mr. Alfred Smith, architect, of Mitcheldean, Gloucestershire.

The Building Committee of Yarmouth Town-hall, which is to be opened in June next by H.R.H. the Prince of Wales, have accepted the contracts of Messrs. Norman & Son, Great Yarmouth, and Messrs. John Finch & Co., City-road, London, for furniture and fittings.

Raglan Music Hall.—The Building Act Committee of the Metropolitan Board at their last meeting instructed the Solicitor to proceed against the owner of the above hall for not carrying out the structural alterations certified by the Superintending Architect to be necessary for the protection of the public in case of fire.

Mission House.—The opening of a new Mission House took place on Saturday last at St. Stephen's, Smethwick. The furnishing throughout, including a silk-velvet altar frontal, was supplied by Messrs. Jones & Willis.

TENDERS

For new roads and sewers on building estate, next to Castle-hill Station, Ealing, for Messrs. Johnston, Palmer, & Petter. Mr. F. Beeston, surveyor:—

R. & G. Neal	£4,425 0 0
James Neal	4,314 0 0
E. Taylor	4,271 0 0
Nye	4,261 0 0
Hampton	4,246 0 0
T. L. Green	4,240 0 0
Nowell & Robson	4,108 0 0

For new coffee tavern, Blagrave-street, Reading, for Mr. R. Oakshott. Messrs. Brown & Albury, architects:—

Weaver, Reading (accepted)	£1,532 0 0

For new business premises, Friar-street, Reading, for Mr. J. Gregory. Messrs. Brown & Albury, architects:—

Kingerlee, Banbury (accepted)	£2,950 0 0

For pulling down and rebuilding the "Bull's Head," Bread-street, for Mr. J. T. Benson. Mr. Benjamin Tabberer, architect:—

Lea	£4,830 0 0
Downs	4,634 0 0
Ashby	4,551 0 0
Rider	4,541 0 0
Mark	4,540 0 0
Sabey	4,400 0 0
Lawrence	4,398 0 0
Taylor & Parfitt	4,349 0 0
Perry	4,345 0 0
Brass	4,110 0 0
Conder	4,100 0 0

For altering warehouse, Finsbury-pavement, for Mr. Morley. Mr. W. Seckham Witherington, architect:—

Russell	£610 0 0
Larke	564 0 0
Taylor & Parfitt	539 0 0
Scrivener & Co.	533 0 0

For superstructure of building, corner of Lime-street and Fenchurch-street. Mr. H. H. Collins, architect. Quantities supplied by Messrs. Batstone Bros.:—

J. & J. Greenwood	£21,380 0 0
D. King & Sons	20,973 0 0
Ashby & Horner	20,610 0 0
Bangs & Co. (too late)	20,605 0 0
Colls & Sons	20,520 0 0
Dove Bros.	20,500 0 0
Chappell	20,481 0 0
W. Downs	20,380 0 0
J. Morter	29,258 0 0
Kirk & Randall	19,880 0 0
Merritt & Ashby	19,777 0 0

For rebuilding 30, Draper-street, Walworth-road, for Mr. F. Jourdan. Mr. Edgar Leuchars, architect:—

Roberts	£2,242 0 0
Lynde	2,080 0 0
Lawrance	2,040 0 0
Rider & Son	1,986 0 0
Colls & Sons	1,967 0 0
Downs	1,947 0 0
Croaker	1,936 0 0
Tarrant & Son	1,900 0 0

For new road, culvert, &c., on land in rear of Liliput road, Victoria Docks, for the Rev. J. Roe and Trustees Mr. E. P. Loftus Brock, architect:—

Rutty	£990 0 0
Blackmore	980 0 0
Mattock Bros.	955 0 0
Brass	949 3 3
Harris	868 19 6
Howard	799 0 0
Jackson (accepted)	792 0 0

For rebuilding premises in Cambridge-road, for Mr. Henry Greyham. Mr. Lewis Solomon, architect:—

Bolding	£1,295 0 0
Canning & Mullins	1,082 0 0
Hewlett	1,080 0 0
Barnett	1,000 0 0
Palmer (accepted)	925 0 0

For the construction of roadworks on the United Land Company's Woking estate:—

E. & W. Iles, Wimbledon	£1,195 0 0
M. W. Rowles, Acton	1,090 0 0
C. Lyons, Wandsworth	1,080 0 0
A. T. James, Hythe	1,052 0 0
T. Skinner, Horsham	929 17 0
Wilkes & Co., Devonshire-sq., E.C.	904 0 0
W. Harris, Camberwell	854 0 0
J. Hare, Clapham	825 0 0
Martin, Wells, & Co.,* Aldershott	800 0 0

* Accepted.

For the erection of house, stables, &c., at Wollaston, for Mr. A. T. A. Pryce. Quantities supplied:—

Farden & Roozly, Wellingborough	£504 15 0
J. Morris, Wellingborough	485 0 0
G. H. Green, Wellingborough	474 19 0
G. Hacksley, Wellingborough	454 0 0
J. Underwood, Wellingborough	445 0 0
G. E. Brown, Wollaston	443 10 0
Coopers, Wollaston	403 2 6
R. Marriott, Wellingborough	383 0 0

For new roads at Hendon:—

Vernon & Ewens, Westminster-chambers	£1,000 0 0
J. Pizzey, Hornsey	825 0 0
G. Impey, Leytonstone	595 10 0
Wilkes & Co., Devonshire-sq., E.C.	593 0 0
W. Miles & Co., Haverstock-hill	555 11 2
G. G. Rutty, Bromley-by-Bow	431 0 0
Wm. Adams, Amhurst-road, N.	416 0 0
A. J. Catley,* Lloyd-square	410 5 0

* Accepted.

For the erection of a pair of semi-detached houses, Mount Park Estate, Harrow-on-the-Hill South, for Mr. W. Winkley. Messrs. Carpenter & Ingelow, architects:—

W. Hussey	£2,190 0 0
Marriott Bros.	1,885 0 0
H. Haynes	1,850 0 0
A. & H. Jarvis	1,796 0 0
J. Kindell	1,710 0 0
Pearse & Banyard	1,575 0 0

For reinstatement of premises, 246 and 248, Hackney-road, damaged by fire, for Mr. H. J. Faulkner. No quantities:—

Fulley	£845 0 0
Thomas & Butland	779 0 0
Jarvis & Sons	580 0 0

For the erection of stabling at "The Yews," Kenley, Surrey, for Mr. J. Webster. Mr. W. Seckham Witherington, architect:—

F. G. & R. Vigor (accepted)	£696 0 0

For making, metalling, and sewering private streets, and also for the sewering and draining of land, both situate in the parish of Evington, near Leicester. Mr. Frederick Jackson, engineer. Quantities supplied:—

	Roads.	Land Drainage.
Gibbins & Osborne	£646 11 2	£81 0 5
Wm. Cordon	504 4 9	74 0 0
Thos. Smart	478 3 0	93 10 0
Jno. Lea & Co.*	458 5 0	76 17 0

* Accepted.

For additions and alterations to St. Mary's Catholic Church, Croydon. Mr. Fredk. A. Walters, architect. Quantities supplied by Mr. W. H. Brayshaw:—

Conder	£5,596 0 0
Dove Bros.	5,420 0 0
Carless	5,032 0 0
Deards	4,913 0 0
Macey & Sons	4,471 0 0
Parmenter,* Braintree, Essex	4,178 16 0

* Accepted.

For warming and ventilating, by their new hydro-caloric apparatus, the new Synagogue at St. John's Wood. Mr. H. H. Collins, architect:—

J. Weeks & Co., Chelsea	£167 0 0

For alterations and additions to the Baker and Basket public-house, Appold-street, City. Mr. Edward Brown, architect:—

Shurmur (accepted)	£207 0 0

For second portion of Bristol University College. Mr. Chas. F. Hansom, architect. Quantities supplied :—

Veals	£6,150	0	0
A. J. Beaven	6,005	0	0
Cowlin & Son	5,867	0	0
Hatherley Bros.	5,857	0	0
Church	5,839	0	0
Davis	5,645	0	0
Stephens & Bastow	5,500	0	0
Clark, Fishponds	5,422	0	0
Eastabrooke & Sons	5,100	0	0
Wilkins & Sons	5,000	0	0
Brock & Bruce	5,000	0	0
Forse	4,990	0	0
Lewis & Edbrooke	4,940	0	0
Howell & Son (accepted)	4,695	0	0

For St. James's Congregational Church and School, Newcastle-on-Tyne. Mr. T. Lewis Banks, architect. Quantities by Mr. J. Sargeant :—

Gibson, Newcastle	£14,344	1	0
Elliott, North Shields	13,896	0	0
Goadon & Son, Durham	13,750	1	2
J. & W. Lowrey, Newcastle	13,733	0	0
Broomhead & Keswick, Newcastle.	12,899	0	0
W. & R. Reid, Newcastle	12,424	9	5
Grisedale, Newcastle	12,388	19	10
Robson & Son, Durham	12,110	0	0
Scott, Newcastle (accepted)	11,437	12	3

For the erection of first portion a firework factory, stores, stables, &c., at Mitcham, for Mr. James Pain. Mr. Spencer Green, architect :—

G. Barnes	£560	0	0
B. Cooke & Co.	440	0	0
J. Marsland	435	0	0
T. Ennor, Julian, & Co.	425	0	0
T. Green	400	0	0
J. Holloway	384	0	0
R. G. Battley	380	0	0
Smith & Bulled	375	0	0
Burch & Moor	375	0	0
A. Capsey	370	0	0
Turtle & Appleton	346	0	0
G. Eddy (accepted)*	345	0	0
S. Page	313	0	0

* Extra for red bricks, &c., 30*l.*

For the erection of new schools, Hague-street, Bethnal-green, for the School Board for London. Mr. E. R. Robson, architect :—

W. G. Larke	£10,392	0	0
F. & F. J. Wood	10,234	0	0
J. R. Hunt	10,077	0	0
W. Shurmur	9,862	0	0
Higgs & Hill	9,784	0	0
B. E. Nightingale	9,624	0	0
J. T. Sargeant	9,481	0	0
Stimpson & Co.	9 397	0	0
C. Cox	9,198	0	0
E. Lawrence	9,125	4	0
T. Boyce	8,773	0	0

For the Orlestone U.D. Board Schools. Mr. A. Smith, architect :—

Knock, Ashford	£1,150	0	0
Bingham, Headcorn	1,137	0	0
Petts, Folkestone	1,112	0	0
Cozens, Canterbury	1,094	0	0
Jorden, Dymchurch	1,050	0	0
Denne, Walmer	1,047	0	0
Howland Bros., Ashford	1,028	0	0
Bourne, Woodchurch	999	0	0
Martin, Ashford	996	0	0
Haisell, Lydd	990	0	0
Dryland, Ashford(accepted)	982	0	0

For the erection of a Board School, at Cinderford, Gloucestershire, for the Forest of Dean U.D. School Board. Mr. Alfred Smith, architect. Quantities by the architect :—

Pearson, Ross	£2,752	0	0
Jones & Co., Gloucester	2,428	0	0
King, Gloucester	2,338	0	0
Billings, Bros , Cheltenham	2,263	0	0
Coleman, Bros., Chaxhill (accepted)	2,215	0	0
Downton, Drybrook	2,200	0	0
Duggan & Nourse, Leominster	2,170	0	0

For the erection of boundary-walls, gates, and making and draining playgrounds, at new Board Schools, Steam Mills, Gloucester, for the Forest of Dean U.D. School Board. Mr. Alfred Smith, architect. Quantities by the architect :—

Coleman Bros., Chaxhill (accepted)	£455	10	0
Duggan & Nourse, Leominster	446	8	1
Mills & Marfell, Cinderford	442	16	1

For the erection of a Board School and teacher's residence, at Lydbrook, Gloucestershire, for the Forest of Dean U.D. School Board. Mr. Alfred Smith, architect. Quantities by the architect :—

Stephens & Bastow, Bristol	£2,449	0	0
Welsh, Hereford	2,438	0	0
Jones & Co., Gloucester	2,284	0	0
Morgan, Monmouth	2,213	18	6
King, Gloucester	2,088	0	0
Coleman Bros., Chaxhill	2,045	0	0
White, Abergavenny	1,986	0	0
Foster, Abergavenny (accepted)	1,900	0	0

For the erection of boundary-walls, gates, and making and draining playgrounds, at new Board Schools, Joysgreen, Gloucestershire, for the Forest of Dean U.D. School Board. Mr. Alfred Smith, architect. Quantities by the architect :—

Watkins, Lydbrook	£760	0	0
Foster, Abergavenny (accepted)	750	0	0

For heating Board schools at Steam Mills, Gloucester, for the Forest of Dean U. D. School Board. Mr. Alfred Smith, architect :—

Jackson, Liverpool (hot-water H.P.)	£93	0	0
Jones & Sons, London (hot-water L.P.)	92	0	0
King, Liverpool (hot-water H.P.)	66	0	0
Holden, Sheffield (hot-water L.P.)	63	10	0
Shillito & Shorland, Manchester (Manchester grates)	54	10	6
Holden, Sheffield (hot air)	44	0	0

N.B.—All except Shillito & Shorland's tender includes carriage and fixing.

TO CORRESPONDENTS.

H. & D. B.—M.—A. J. R.—W. G. L.—Manitoba.—E. K.—W. S. W.—J. V.—E. G.—F. E. W.—F. J.—T. & P.—O H.—L. S.—L. B.—Major M.—A. M.—J. U.—S. & M.—E. S. R.—F. A. W.—M. H. J.—T. B.—M. M.—F. & Co.—A. S.—J. B.—H. J J.—T. & B.—B A.—E. W. (beyond our province; employ a surveyor).—T. G. H. (why not have sent some particulars of the paper?)—E. H (the insertion of inquiry would bring a number of letters we should not be able to insert).—Rhyl (name illegible; we need some knowledge of a stone before allowing it to be recommended).—Mechanic (inquire of Lockwood & Co.)—R. P. (shall be considered next week).—W. P. (next week)—T. P. (next week)—Mr. B. (next week).—G. McD. (next week.—X. C.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

NOTICE TO SUBSCRIBERS.

THE INDEX and TITLE-PAGE for Volume XLI. (July to December, 1881), was given as a Supplement with the issue of January 14th last.

A COLOURED TITLE-PAGE may be had, gratis, on personal application at the Office.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING-CASES (Cloth), with Strings, to hold a Month's Numbers, price 2s. each.

THE FORTY-FIRST VOLUME of "The Builder" (bound) is now ready, price Twelve Shillings and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS TRADE, AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade Advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c. may be obtained on application to the Publisher.

SITUATIONS WANTED.

FOUR Lines (about THIRTY words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

REPLIES TO ADVERTISEMENTS,

Addressed Box ——, Office of "The Builder,"

Cannot be forwarded, but *must* in all cases be *called for*, and the Office Receipt produced.

THE CHARGE FOR A BOX IS AS UNDER :—

For "Situations Wanted" Advertisements ..... 3d. per Week.
For all other Advertisements ..... 6d. per Week

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable at the Post-office, King-street, Covent-garden, W.C. to

DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied *direct* from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum, *prepaid*. Remittances payable to DOUGLAS FOURDRINIER, Publisher, 46, Catherine-street, W.C.

Best Bath Stone.
WESTWOOD GROUND,
Box Ground, Combe Down,
Corsham Down,
And Farleigh Down.
RANDELL, SAUNDERS, & CO., Limited,
Corsham, Wilts. [ADVT.

Box Ground Stone
Is the best for use in all exposed positions, being a well-known and tried weather stone.
50,000 feet cube in stock.
PICTOR & SONS,
Box, Wilts. [ADVT.

Doulting Freestone and Ham Hill Stone of best quality, in blocks, or prepared ready for fixing. An inspection of the Doulting Quarries is respectfully solicited; and Architects and others are CAUTIONED against inferior stone. Prices, delivered to any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset. — Agent, Mr. E. WILLIAMS, 73, Charlotte-street, Portland-place, W. [ADVT.

Doulting Stone and Ham Hill Stone, of best quality. Prices and Estimates, including delivery to any Station, on application to STAPLE & HANN, Quarrymen, Stoke-sub-Hamdon, Ilminster. Agent, Mr. E. CRICKMAY, Langbourn-chambers, 17, Fenchurch-street, E.C. [ADVT.

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [ADVT.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. [ADVT.

Immense quantities of
DRY WAINSCOT,
DRY MAHOGANY,
DRY WALNUT,
in all thicknesses.
B. J. HUDSON & SONS,
Whitfield-st., W., and Great Peter-st., S.W.,
London. [ADVT.

MICHELMORE & REAP,
Manufacturers of
CHARLES COLLINCE'S PATENT
COLLINGE'S PATENT HINGES,
LEVER, SCREW, & BARREL BOLTS,
Self-Acting "FALL DOWN" GATE STOPS,
and IMPROVED GATE FITTINGS of every Description.
36A, BOROUGH ROAD,
LONDON, S.E.
Discount to Builders.
Illustrated List two stamps.

ZINC ROOFING
FIXED COMPLETE.
F. BRABY & CO.,
ESTABLISHED 1837,
THE MANUFACTURING AGENTS OF THE VIEILLE MONTAGNE CO.
PATENT SOLID UNSOLDERED RIDGE PLATES, FOR ITALIAN OR SQUARE ROLL CAP ZINC ROOFING.
By the adoption of this Method the use of Solder is Entirely Dispensed with, and consequently the Danger incurred by the use of Fire-pots is Avoided. The Cost is Lessened and the Durability Increased. Estimates for Zinc Dormers, Flats, &c.
FITZROY WORKS, 356 TO 360, EUSTON ROAD, LONDON.
ALSO AT DEPTFORD, LIVERPOOL, GLASGOW, and CYPRUS.
Architects, Engineers, and Contractors Supplied with Drawings and Estimates Free of Charge.